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THE

NATIONAL FORMULARY

FOURTH EDITION

BY AUTHORITY OF THE
AMERICAN PHARMACEUTICAL ASSOCIATION

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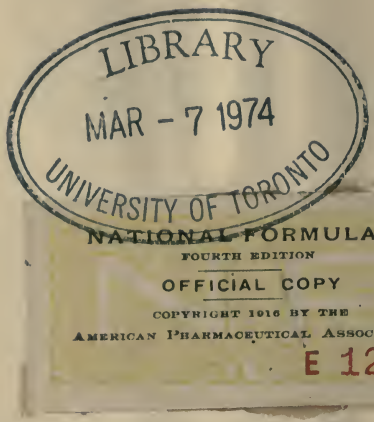

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FOURTH EDITION

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THE NATIONAL FORMULARY
OF UNOFFICIAL PREPARATIONS

FIRST EDITION.....1888
SECOND EDITION (First Revision).....1896
THIRD EDITION (Second Revision).....1906

THE NATIONAL FORMULARY

FOURTH EDITION (Third Revision).....1916

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(Adopted by the Council March 8, 1916)

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HISTORICAL INTRODUCTION

FROM the earliest days of the American Pharmaceutical Association the need was recognized of an authoritative formulary, extra to the Pharmacopœia, to contain the preparations of a non-secret character which were commonly prescribed by physicians under incomplete or varying formulas. Individual samples of such preparations as elixirs, wines, emulsions, solutions, etc., would vary in minor ingredients, sometimes in strength, and frequently in color, flavor and general appearance, according to the choice of the maker. Oftentimes the differences in any particular preparation were of little or no importance therapeutically, but were manifested in physical properties sufficiently to cause confusion among physicians and patients, and to require that the pharmacist carry in stock several different brands of the article in order to supply the demands of his trade. Thus both ethical and economic conditions in pharmacy called for a standard formulary of recognized authority which would eliminate non-essential differences and would supply uniform preparations, not included in the Pharmacopœia, for use by physicians. The American Pharmaceutical Association quickly gave attention to this problem, and as early as 1856 a committee was appointed by the President "to collect and report to the next meeting . . . unofficial formulas in local use with many physicians of our Union." At the meeting of 1857 this committee of ten reported formulas for eighty-three preparations, which were adopted by the Association. The committee was continued and enlarged, and the following year fourteen additional formulas were submitted. But the second report contains a hint that unfavorable criticism had appeared, and the committee was then discontinued.

In 1883 another committee was appointed, termed the Committee on Unofficial Formulas, and consisting of J. W. Colcord, Lynn, Mass., chairman; James T. Shinn, Philadelphia; N. Hynson Jennings, Baltimore; Charles Becker, Washington; J. D. Wells, Cincinnati; S. A. D. Sheppard, Boston; A. Vogeler, Chicago; W. M. Alexander, St. Louis; Emlen Painter, San Francisco; and C. L. Keppler, New Orleans.

The same year, Professor J. U. Lloyd published a book of elixir formulas, entitled "Elixirs," and containing 283 formulas.

The New York and Brooklyn Formulary was also published in this year—a book which was the work of a joint committee appointed by the New York College of Pharmacy, the German Apothecaries Society of New York, and the King's County Pharmaceutical Association.

This book was designed particularly to meet the needs of the druggists of New York City and vicinity, and it quickly proved its merits. It contained 81 formulas, of which 52 were for elixirs, 10 for emulsions, and the remaining 19 for miscellaneous preparations.

The following year the Committee on Unofficial Formulas reported that a number of formulas had been collected, some of which had been tried, and that the work was well begun. Professor Lloyd had offered the use of any formulas in his book on "Elixirs" which might be wanted, and a request had been made to the committee in charge of the New York and Brooklyn Formulary for permission to use that work as a basis for a National Formulary.

The work had been heavily handicapped by the geographical distribution of the committee, which had prevented meetings, and had necessitated considerable time for correspondence by mail. The committee therefore recommended that another committee be appointed to continue the work, to consist of five from some locality where meetings could be held as needed.

The following committee was then appointed by the President: Chas. Rice, chairman, P. W. Bedford, W. P. DeForest, S. J. Bendiner and A. Tsheppe—all of New York or Brooklyn. This committee reported the following year that an agreement had been made with the societies controlling the New York and Brooklyn Formulary, and the following resolution was presented by A. E. Ebert and adopted by the Association:

"Whereas, Our Committee on Unofficial Formulas report that the several pharmaceutical bodies under whose auspices the New York and Brooklyn Formulary has been published have signified their willingness without remuneration, and for the benefit of the profession at large, to surrender to the American Pharmaceutical Association all interest in said Formulary; therefore,

"*Resolved*, That the American Pharmaceutical Association accept and publish the same in the forthcoming Proceedings with its approval and endorsement, and that its Committee on Unofficial Formulas be directed to continue and complete the revised edition of the Formulary now well under way, with a view to making it national in character; and,

"*Resolved*, That said revision, when completed, be published by the American Pharmaceutical Association in such form as to place it within easy reach of all pharmacists."

The committee was then reappointed for the succeeding year and held meetings almost weekly during that time, being assisted by committees specially appointed for the purpose by the pharmaceutical

organizations of New York and Brooklyn, and by correspondence with various state pharmaceutical associations.

The report of the committee, made in 1886, embodied a draft for a National Formulary, consisting of 414 titles and, in most cases, the formulas recommended therefor, which was published in the Proceedings of that year.

The committee of five was again continued and there was added to it one representative of each state pharmaceutical association, as follows: Alabama, P. C. Candidus; Arkansas, J. E. Gibson; California, Emlen Painter; Connecticut, C. A. Rapelye; District of Columbia, H. E. Kalusowski; Dakota, H. L. Warne; Georgia, J. W. Rankin; Illinois, C. S. N. Hallberg; Indiana, G. W. Sloan; Iowa, T. W. Ruete; Kansas, R. J. Brown; Kentucky, C. L. Diehl; Louisiana, A. K. Finlay; Maryland, C. Caspari, Jr.; Massachusetts, W. W. Bartlet; Michigan, A. B. Stevens; Minnesota, W. S. Getty; Mississippi, S. P. Head; Missouri, J. M. Good; Nebraska, N. A. Kuhn; New Hampshire, M. S. Woodman; New Jersey, C. B. Smith; New York, L. F. Stevens; North Carolina, E. V. Zoeller; Ohio, L. C. Hopp; Pennsylvania, C. T. George; Rhode Island, E. A. Calder; South Carolina, G. J. Luhn; Tennessee, J. S. Robinson; Texas, E. M. Wells; Virginia, C. A. Santos; West Virginia, C. Menkemeller; Wisconsin, F. B. Power; Quebec, Wm. Ahern; Ontario, E. Gregory.

The name of the committee was then changed to "The Committee on National Formulary."

The following year was occupied in trying various formulas for the adopted preparations and in harmonizing the desires of the various sections of the country as to the scope of the Formulary. This work was again continued until 1888, when the first edition of the National Formulary was published, both as an appendix to the Proceedings and as a separate book.

The following significant paragraph appears in the final report of the committee regarding the status of the National Formulary: "Your Committee is convinced that it only expresses the unanimous sense, not alone of the members of this association, but of all progressive and fair-minded pharmacists throughout the land, that there is and shall be only *one* standard, as to quality and strength, to be followed for all official preparations, viz., the United States Pharmacopœia; and that, therefore, the National Formulary—which is, at most, intended only as a stepping-stone from and to that authority—is a standard only for those preparations which are *not* provided for by this official work; and further, that from the moment when the United States Pharmacopœia

shall provide a formula, a standard for any article or preparation now or hereafter contained in the National Formulary, the authority of the latter regarding this article or preparation ceases and is abolished."

The report was supplemented by an exhibit of samples of the preparations included in the National Formulary, prepared by the committee and others, and displayed during the meeting of the Association at Detroit.

This first edition contained formulas for 435 preparations, arranged alphabetically and also numbered consecutively. It contained no titles except for pharmaceutical preparations, and the apothecaries system of weights and measures was used in formulas, which were designed for internal administration, while a few were directed in "parts" by weight.

Regarding the scope of this edition, the report of the committee says: "The National Formulary to be published under the authority of the American Pharmaceutical Association may contain the formulas of such preparations as have either been formerly official in the United States Pharmacopœia and have been discarded, though still in demand, or such as have never been official but deserve recognition, because more or less in general use. Among the latter may be any preparation contained in foreign pharmacopœias if there is known to be sufficient demand for it, in any section of the country. It shall also contain the preparations belonging to the so-called 'elegant pharmacy' but it shall not be encumbered with purely technical, trivial or fancy preparations."

This policy has prevailed throughout all subsequent revisions of the book.

By direction of the Association another committee was immediately appointed to revise the book, such revision to be accomplished at a time to be decided by the committee. As before, the committee consisted of five members at large appointed by the President and one member representing each state pharmaceutical association and the pharmaceutical associations of Canada.

The members at large were C. Lewis Diehl, chairman, C. S. N. Hallberg, G. H. C. Klie, C. T. P. Fennel, and Adam Conrath.

The members representing pharmaceutical associations were: Alabama, P. C. Candidus; Arkansas, J. B. Bond; California, Val. Schmidt; Colorado, C. M. Ford; Connecticut, C. A. Rapelye; Delaware, F. R. Smith; District of Columbia, S. L. Hilton; Florida, J. M. Dixon; Georgia, Geo. D. Case; Illinois, R. E. Rhode; Indiana, Geo. W. Sloan; Iowa, G. H. Schafer; Kansas, L. E. Sayre; Louisiana, N. R. Girling; Maine, N. S. Harlow; Maryland, Chas. Caspari, Jr.; Massachusetts, W. W. Bartlet;

Michigan, A. B. Stevens; Minnesota, F. F. Stark; Mississippi, J. A. Shell; Missouri, J. M. Love; Nebraska, N. A. Kuhn; New Jersey, Chas. B. Smith; New York, Geo. B. Wray; North Carolina, E. V. Zoeller; North Dakota, E. C. Maney; Ohio, J. A. Nipgen; Oregon, H. Dixon Dietrich; Pennsylvania, Chas. T. George; Quebec, H. R. Gray; South Carolina, Chas. F. Panknin; South Dakota, G. W. Lowry; Tennessee, J. O. Burge; Texas, E. M. Wells; Washington, H. E. Holmes; West Virginia, Edwin L. Boggs.

This committee found that the first edition of the Formulary was quite satisfactory and that but little revision of the formulas was necessary. A new issue to follow closely the seventh revision of the United States Pharmacopœia was decided upon. The seventh revision of the Pharmacopœia appeared in 1894, and the first revision of the National Formulary was submitted in 1895 and published in 1896.

This second edition embodied a revision of such of the formulas in the first as were found to need changing, a number of new formulas, and the preparations which were dropped from the Pharmacopœia in the seventh revision. The metric system of weights and measures was used exclusively in the formulas, but the strength of preparations in active constituents was stated in the apothecaries system.

The second edition contained a total of 454 articles, all being for pharmaceutical preparations.

The second committee was continued until 1899, but without further duties.

In 1898 a report of this committee, through its chairman, stated that "The privilege of preparing epitomes of the National Formulary has been given freely, on request, to several local and state associations, and these have doubtless done much to familiarize the medical profession with this important adjunct to the U. S. Pharmacopœia. In the opinion of your Committee, however, it would have been better if the Association, instead of recommending, had given positive instructions to the Council and the Committee on National Formulary that an epitome of the National Formulary be published for distribution to the pharmacists." "We would recommend that the Committee on National Formulary be instructed to prepare an official epitome of the National Formulary, to be published in the name of the Association by the Council."

This recommendation was approved by the Association, and in 1899 Chairman Diehl submitted the manuscript for An Epitome of The National Formulary, in which the component parts of the formulas were stated without details of processes, and therapeutic suggestions for the use of each preparation were given, with average doses in both the metric and apothecaries systems, and the whole supplemented by a

therapeutic index. This epitome was published and placed on the market by the Council in 1900.

In 1899 the Association authorized an addendum to the second edition of the National Formulary, to consist of additional formulas, but the following year the chairman advised against this plan and recommended a complete revision of the book to follow as closely as possible the revision of the Pharmacopœia. He also recommended that for this revision the committee consist of the five customarily appointed by the President and an auxiliary committee of ten to be selected by the chairman.

Accordingly the following committee was appointed in 1900 for the second revision: C. Lewis Diehl, chairman, C. S. N. Hallberg, Chas. Caspari, Jr., Wilbur L. Scoville, W. C. Alpers. Auxiliary Committee: G. C. Diekman, E. G. Eberle, L. Emanuel, F. W. E. Stedem, H. P. Hynson, F. W. Meissner, Jr., Wm. Mittlebach, Edw. Raeuber, C. A. Rapelye, A. B. Stevens.

F. W. E. Stedem was succeeded in 1901 by Francis Hemm.

The third edition was published in 1906, about a year after the eighth revised U.S.Pharmacopœia. In this edition both the metric and apothecaries systems of weights and measures were used in the formulas, but not as exact equivalents, and this system gave rise to considerable criticism and some confusion. Doses were also introduced.

As before, all preparations dropped from the Pharmacopœia were added to the Formulary, but these, together with the articles taken from the previous Pharmacopœia, were placed together in an Appendix, thus making two parts to the book. The Appendix contained 115 formulas, taken from the sixth and seventh revisions of the Pharmacopœia.

The main portion of the book contained 502 formulas, being an increase of 32 over the previous edition. Forty-nine formulas had been added and 17 dropped.

The previous practice of numbering the formulas consecutively was abandoned.

Very soon after the publication of this third edition, the passage of the Federal Food and Drugs Act made it a legal standard and placed it on a par with the Pharmacopœia in legal standing. This unexpected situation caused a close scrutiny of the book and a few corrections in formulas were made at once. But the work stood the test well and remained substantially as first issued during the ten years that it was in effect.

With the fourth edition the book assumes its place as a legal standard, prepared with a view to that position, and aims to meet the responsibilities which are upon it.

PREFACE

IT is well known that the United States Pharmacopœia supplies formulas for only a limited number of the more commonly used medicines, and that there are many other remedies, more or less extensively used by the medical profession, for which standards and uniform formulas should be provided. It was this necessity which led to the preparation and publication of the National Formulary.

The first edition and the two succeeding revisions were prepared for this purpose only—to supply extra-pharmacopœial formulas which might bring uniformity in practice to both physician and pharmacist. The third edition (being the second revision) was published only a few weeks prior to the enactment, by Congress, of the Food and Drugs Act of June 30, 1906. This Federal Act named as the legal authority for drugs the United States Pharmacopœia and the National Formulary, and this gave to the latter book a new and important status. The original plan of the book had been followed in the second revision, and the revisers had not foreseen its adoption as a legal standard. At once it became apparent that the work was inadequate for this purpose, and plans were formulated for another revision to accord with the new responsibilities of the book.

In accordance with the previous plans of revision, a committee of five was appointed by the President of the American Pharmaceutical Association, and an auxiliary committee of ten was chosen to act with it in revising the work. In 1908 the Council formally elected the fifteen men thus selected as the Committee on National Formulary to act for the full period of the revision. A conference of this committee was held at Hot Springs, Ark., in September, 1908. The committee presented a report on the general principles to govern the revision, and upon their recommendation the American Pharmaceutical Association, at its annual convention in that year, adopted the following principles to be followed in this revision of the National Formulary:

That the coöperation of the medical profession and the Medical Departments of the National Government be secured.

That the present scope of the Formulary, as indicated in the Preface, be continued.

That conservative action and liberal interpretation be given to the consideration of suitable articles for the Formulary.

That the metric system only be used.

That the strength of liquid preparations be stated as so many grammes in one hundred cubic centimeters.

That all formulas be uniform in style.

That nomenclature, titles and synonyms be in conformity with the United States Pharmacopœia or with modern ideas, and that the titles should be descriptive of composition, and therapeutic or anatomical titles should be discouraged.

That suitable definitions for unofficial ingredients may be added.

That the term "Appendix" be eliminated, and the book designated as Parts I and II.

That the title of the book be The National Formulary.

That a statement be inserted in the Preface to the effect that the National Formulary does not assume any responsibility for the therapeutic value of any preparation, and that the question of additions or eliminations be decided mainly on the basis of commercial demands.

That trademark names shall not be introduced.

That authority be given to the Committee to establish a specific date on which the next edition of the National Formulary shall go into effect.

The first of these recommendations, namely, active affiliation with the medical profession in revision, has proved disappointing. In response to an invitation, the American Medical Association appointed a committee to assist in the work, which met with the National Formulary Committee at Hot Springs, Ark., in 1908, and again at Richmond, Va., in 1910, when it quickly developed that the medical interest in the work was entirely therapeutic, while the basis of revision was directed to be pharmaceutic. These different objects have prevented, in the present revision, that organic coöperation which was sought. The committee has, however, received valuable assistance and cordial coöperation from individual members of the medical profession and attests its high appreciation of the help and advice thus rendered.

In compliance with a request made by the Council of the American Pharmaceutical Association in 1908, the Surgeon General of the Public Health Service, with the consent of the Secretary of the Treasury, directed that the "Digest of Comments on the United States Pharmacopœia" should, in future, also include a report of comments on the National Formulary. All of the volumes published since that time have appeared as a "Digest of Comments on the Pharmacopœia of the United States and on the National Formulary."

This coöperation on the part of the U. S. Public Health Service has been of practical value, not alone by calling attention to comments and

suggestions that have been made for improving the National Formulary, but has also, because of the methodical presentation of the available references, served as an incentive for more systematic contributions on the part of individuals interested in perfecting the National Formulary as a standard under existing statutes.

The scope of the present National Formulary is the same as in previous issues, and is based upon medical usage rather than upon therapeutic ideals. The committee consists entirely of pharmacists, or of men with a pharmaceutical training, and it cannot presume either to judge therapeutic practice or to follow any particular school of therapeutic practice. The question of the addition or deletion of any formula was judged on the basis of its use by physicians and its pharmaceutical soundness. The considerable use by physicians of any preparation was considered sufficient warrant for the inclusion of its formula in the book, and a negligible or diminishing use as justifying its exclusion. A few formulas were discarded because of difficulties or imperfections which render them pharmaceutically unsatisfactory. It was for this reason that Elixir of the Phosphates of Iron, Quinine and Strychnine was dropped from the Pharmacopœia and not adopted by the National Formulary.

Some preparations were displaced by others of a similar character which have proved more satisfactory or more economical.

Such formulas as were taken from the U. S. Pharmacopœia VIII, or from previous revisions of the Pharmacopœia, are included in Part I of the National Formulary and not in an appendix, as in the previous issue.

Fluidglycerates are a newly-introduced class of preparations which have some pharmaceutical advantages. These are of the same strength as fluidextracts, and are made with glycerin and water as a menstruum. They are usually miscible with water. The present list is short, and it can be extended in future revisions if the demand for these increases.

The class of Saponated Petrolatums (*Petrolata Saponata*) has been considerably extended and the title shortened to Petroxolin, Lat. *Petroxolinum*. The title "Unguenta Extensa" has been replaced by the shorter title "Mulla." A few other titles have been shortened, but the committee has not found it practicable to simplify many of the longer titles.

In providing suitable definitions and tests for ingredients used in the formulas but not standardized in the U.S.P. IX, the committee was confronted with a task of no small magnitude. Fortunately the American Pharmaceutical Association had, in 1908, taken action providing for

the creation of a Committee on Standards for Unofficial Drugs and Chemicals. This committee was appointed and began its work in 1909. Although its appointment had no connection with the revision of the National Formulary, it was recognized that the work of this committee was correlated and might be made a part of the revision. At the request of the Committee on the National Formulary, the Council directed the Committee on Standards to coöperate in the preparation of the needed standards for drugs and chemicals used in the National Formulary.

These standards and tests constitute Part II of the present book, and is the work of the Committee on Standards for Unofficial Drugs and Chemicals, approved and adopted by the Committee on National Formulary.

In the preceding edition the use of two systems of weights and measures proved a source of confusion, and the metric system only is now used except for the doses, where the two systems are employed, not as equivalents, but as separate systems.

Following the recommendation of the United States Bureau of Standards, the U. S. Pharmacopœia decided to adopt the term "milliliter" in place of cubic centimeter and it was deemed wise to follow the lead of these authorities and in this revision the term "milliliter" or its abbreviated synonym "mil" is used throughout. It is to be understood that a milliliter is practically the same as a cubic centimeter, the former being the correct term for a unit of liquid measure.

The initials "P. I.," which occur after certain of the synonym-titles, indicate that the preparation corresponds in strength with the standard adopted in the International Protocol of the Brussels Conference of 1902.

Throughout the book the nomenclature and general style of formulas and descriptions have been made to accord with the U. S. Pharmacopœia IX, and the Formulary has been held back to some extent in order that the two books may be in full agreement. The Pharmacopœia has taken the lead in these matters, the Formulary following. This plan has permitted also the addition to the Formulary of certain drugs and preparations which were dropped from the Pharmacopœia at a late date.

An attempt was made to secure greater uniformity in the color of artificially colored preparations by standardizing the coloring agents. The results, while encouraging, were not considered sufficiently reliable to be included in this revision. Tincture of Caramel was introduced as a step toward greater uniformity in color, and it is hoped that in future revisions it may be possible to secure satisfactory and reliable methods of standardizing all colors used.

It was planned also to state the alcoholic strength of all preparations containing alcohol, but as the work progressed the inevitable variations in alcoholic strength of many preparations, particularly fluidextracts and tinctures, became apparent, and since such statements, if made, would become a part of the legal requirements of the preparations, it was deemed advisable to omit them. At the present time, statements of the alcoholic strength of preparations are needed chiefly for interstate commerce, and are rarely required for local trade.

Following the example of the U.S.P. IX, abbreviations of the titles have been introduced as an aid to prescription writing and for concise labelling. The use of these is recommended in place of the longer titles, in prescriptions and to avoid ambiguity.

A chapter on Sterilization has been added for the benefit of those who are not especially trained in bacteriological practice. This is to be considered as instructive and advisory, and as improved methods may be developed their absence from this chapter is not to be considered as prohibiting their employment. The chapter has been made as complete in detail as the present status of the science may justify, and the details given represent present knowledge and methods. Pharmacists who specialize in this work should endeavor to keep informed upon the newer developments and to make such applications as shall be justified by the advanced knowledge.

In the present revision 201 formulas have been added and 183 have been dropped, making a total of 601 articles in Part I, of which 12 are descriptive articles and 589 are formulas. Part II contains 188 articles, all of which are new to the National Formulary.

The committee is greatly indebted to Dr. S. Solis-Cohen of Philadelphia for work on the doses, and to Dr. A. B. Lyons of Detroit for valuable suggestions and special work on the proofs. Also to Mr. Joseph Rosin for investigations upon the chemical tests and standards, and to Mr. O. A. Farwell for assistance on the botanical species in commercial use and on the botanical descriptions. The services of these gentlemen have been of great value to the committee and have added materially to the accuracy of the work.

Since the original appointment of the committee, two members have resigned, viz., J. W. England and H. P. Hynson, and two have died, viz., C. S. N. Hallberg and Leo Eliel. The vacancies were filled by the appointment of Otto Raubenheimer, S. L. Hilton, C. M. Snow and Adam Wirth.

Several changes have occurred in the personnel of the Committee on

Standards because of death or resignation. The list appended of this committee contains the names of those who served during the later years when the copy for the National Formulary was completed.

Committee on Standards

Geo. M. Beringer, Chairman
F. R. Eldred
J. M. Francis
E. H. Gane
L. D. Havenhill
J. A. Koch
Henry Kraemer
B. L. Murray
E. L. Newcomb
W. A. Puckner
Otto Raubenheimer
J. G. Roberts
H. H. Rusby
Geo. D. Rosengarten
M. I. Wilbert
E. E. Wyckoff

Committee on National Formulary

C. Lewis Diehl, Chairman
Wilbur L. Scoville, Vice-chairman
H. V. Arny
Geo. M. Beringer
E. Fullerton Cook
H. A. B. Dunning
Wm. A. Hall
S. L. Hilton
C. H. LaWall
Otto Raubenheimer
Leonard A. Seltzer
Clyde M. Snow
A. B. Stevens
M. I. Wilbert
Adam Wirth

LIST OF PREPARATIONS ADDED TO THE NATIONAL FORMULARY

Acetum Opii (U.S.P. VIII)
Aqua Phenolata
Cataplasma Kaolini (U.S.P. VIII)
Ceratum Camphoræ (U.S.P. VIII)
" Plumbi Subacetatis (U.S.P VIII)
" Resinæ Compositum (U.S.P. VIII)
Collodium Stypticum (Replacing U.S.P. VIII)
Confectio Rosæ (U.S.P. VIII)
" Sennæ (U.S.P. VIII)
Elixir Amygdalæ Compositum
" Aromaticum Rubrum
" Cardamomi Compositum
" Formatum
" " Compositum
" Glycerophosphatum Compositum
" Glycyrrhizæ Aquosum
" Sodii Salicylatis Compositum
" Trium Bromidorum
" Vanillini Compositum
Emplastrum Saponis (U.S.P. VIII)
Emulsum Olei Morrhuæ cum Hypophosphitibus (U.S.P. VIII)
" Olei Morrhuæ cum Vitello
Extractum Aloes (U.S.P. VIII)
" Ergotæ Aquosum
" Euonymi (U.S.P. VIII)
" Hæmatoxyli (U.S.P. VIII)
" Ignatiæ
" Krameriæ (U.S.P. VIII)
" Leptandræ (U.S.P. VIII)
" Quassiæ (U.S.P. VIII)
Ferri Oxidum Saccharatum
Fluidextractum Apocyni (U.S.P. VIII)
" Baptisiæ
" Berberidis (U.S.P VIII)
" Calumbæ (U.S.P. VIII)
" Cataríæ
" Chimaphilæ (U.S.P. VIII)
" Chionanthi
Fluidextractum Chiratæ (U.S.P. VIII)
" Cinchonæ Aquosum
" Cocillanæ
" Condurango
" Conii (U.S.P. VIII)
" Convallariæ Radicis (U.S.P. VIII)
" Cubebæ (U.S.P. VIII)
" Cypripedii (U.S.P. VIII)
" Dioscoreæ
" Droseræ
" Echinaceæ
" Euonymi (U.S.P. VIII)
" Eupatorii (U.S.P. VIII)
" Euphorbiæ Piluliferæ
" Galegæ
" Geranii (U.S.P. VIII)
" Hamamelidis Foliorum (U.S.P. VIII)
" Heloniadis
" Krameriæ (U.S.P. VIII)
" Lappæ (U.S.P. VIII)
" Leptandræ (U.S.P. VIII)
" Lupulini (U.S.P. VIII)
" Matico (U.S.P. VIII)
" Mezerei (U.S.P. VIII)
" Pareiræ (U.S.P. VIII)
" Phytolaccæ (U.S.P. VIII)
" Pruni Virginianæ (U.S.P. VIII)
" Quassiæ (U.S.P. VIII)
" Quercus (U.S.P. VIII)
" Rhamni Catharticæ
" Rhois Glabræ (U.S.P. VIII)
" Rubi (U.S.P. VIII)
" Sanguinariæ (Replacing U.S.P. VIII)
" Scutellariæ (U.S.P. VIII)
" Senecionis
" Serpentariæ (U.S.P. VIII)
" Solani

Fluidextractum Stramonii (U.S.P. VIII)
" Thujæ
" Thymi
" Trifolii
" Valerianæ (U.S.P. VIII)
" Viburni Opuli
Fluidglycerata
Fluidglyceratum Cascaræ Sagradæ
" Cascaræ Sagradæ Aromaticum
" Glycyrrhizæ
" Krameriæ
" Rhei
Gargarisma Guaiaci Compositum
Infusum Gentianæ Compositum
" " Pruni Virginianæ (U.S.P. VIII)
Inunctum Mentholis
" " " Compositum
Liquor Alumini Acetatis
" Ammonii Citratis
" Antisepticus (Replacing U.S.P. VIII)
" Chlori Compositus (Replacing U.S.P. VIII)
" Ferri Salicylatis
" Hydrargyri Nitratis (U.S.P. VIII)
" Hydrastinæ Compositus
" Pepsini Antisepticus
" Phosphatum Compositus
" Picis Carbonis
" Sodii Phosphatis Compositus (Replacing U.S.P. VIII)
Magma Ferri Hydroxidi (U.S.P. VIII)
Mel Rosæ et Sodii Boratis
" Sodii Boratis
Mistura Ferri Composita (U.S.P. VIII)
" Rhei Composita (U.S.P. VIII)
Mucilago Sassafras Medullæ (U.S.P. VIII)
Nebula Aromatica
" Eucalyptolis
" Mentholis
" " " Composita
" Thymolis
Oleatum Atropinæ (U.S.P. VIII)
" Cocainæ (U.S.P. VIII)
" Quininæ (U.S.P. VIII)
Oleatum Veratrinæ (U.S.P. VIII)
Oleoresina Lupulini (U.S.P. VIII)
Oleum Æthereum (U.S.P. VIII)
" Ricini Aromaticum
Pasta Resorcinolis Fortis
Petroxolinum Betanaphtholis
" Cadini
" Chloroformi Camphoratum
" Creosoti
" Eucalyptolis
" Guaiacolis
" Hydrargyri
" Iodi
" " Dilutum
" Iodoformi
" Mentholis
" Methylis Salicylatis
" Phenolis
" " Camphoratum
" Picis
" Sulphuratum
" " Compositum
" Terebinthinæ Laricis
Pilulæ Aloes et Ferri (U.S.P. VIII)
" " " Mastiches (U.S.P. VIII)
" " " Myrrhæ (U.S.P. VIII)
" Catharticæ Vegetabiles (U.S.P. VIII)
" Digitalis, Scillæ et Hydrargyri
" Laxativæ Compositæ (U.S.P. VIII)
" Opii, Digitalis et Quininæ
Pulvis Acetanilidi Compositus (U.S.P. VIII)
" Aromaticus Rubefaciens
Sal Lithii Citratis Effervescens (U.S.P. VIII)
Sevum Benzoinatum
Spiritus Ætheris Compositus (U.S.P. VIII)
" Ammoniæ Anisatus
" Cardamomi Compositus
" Vanillini Compositus
Sulphuris Iodidum (U.S.P. VIII)
Syrupus Ammonii Hypophosphitis
" Ferri, Quininæ et Strychninæ Phosphatum (Replacing U.S.P. VIII)

Syrupus Ficorum Compositus
" Hypophosphitum Compositus (Replacing U.S.P. VIII)
" Iodotannicus
" Krameriæ (U.S.P. VIII)
" Rosæ (U.S.P. VIII)
" Rubi (U.S.P. VIII)
" " Fructus
Tinctura Aloes et Myrrhæ (U.S.P. VIII)
" Cacti Grandiflori
" Calendulæ (U.S.P. VIII)
" Caramellis
" Cimicifugæ (U.S.P. VIII)
" Cocculi Indici
" Delphinii
" Ergotæ Ammoniata
" Gallæ (U.S.P. VIII)
" Ipecacuanhæ et Opii (U.S.P. VIII)
" Krameriæ (U.S.P. VIII)
" Opii Crocata
" Passifloræ
" Pulsatillæ
" Quillajæ (U.S.P. VIII)
" Sabal et Santali
" Serpentariæ (U.S.P. VIII)
Tinctura Vanillæ (U.S.P. VIII)
Tincturæ Medicamentorum Recentium (U.S.P. VIII)
Trochisci Carbonis Ligni
" Gambir (U.S.P. VIII)
" Phenolphthaleini
" Quininæ Tannatis
" Santonini (Replacing U.S.P. VIII)
" Santonini Compositi
" Sulphuris et Potassii Bitartratis
" Ulmi
Unguentum Hydrargyri Oxidi Rubri (U.S.P. VIII)
" Potassii Iodidi (Replacing U.S.P. VIII)
" Veratrinæ (U.S.P. VIII)
" Zinci Stearatis (U.S.P. VIII)
Vinum Antimonii (Replacing U.S.P. VIII)
" Colchici Seminis (U.S.P. VIII)
" Ferri (U.S.P. VIII)
" " Amarum (U.S.P. VIII)
" Ipecacuanhæ (U.S.P. VIII)

LIST OF PREPARATIONS DROPPED FROM THE NATIONAL FORMULARY

Acetum Lobeliæ
" Sanguinariæ
Acidum Citricum Saccharatum
" Hypophosphorosum
" Metaphosphoricum Dilutum
" Tartaricum Saccharatum
Amylum Iodatum
Antimonii Sulphidum Purificatum
Balsamum Traumaticum
Bismuthi Oxidum Hydratum
Boroglycerinum
Caffeinæ Sodio-Benzoas
Ceratum Camphoræ Compositum
" Cetacei
" Extracti Cantharidis
" Sabinæ
Charta Cantharidis
Decoctum Aloes Compositum
" Cetrariæ
Elixir Acidi Salicylici
" Ammonii Valerianatis et Quininæ
" Apii Graveolentis Compositum
" Caffeinæ
" Chloroformi Compositum
" Cinchonæ Pepsinæ et Strychninæ
" Cocæ
" " et Guaranæ
" Digestivum Compositum
" Eucalypti
" Euonymi
" Frangulæ
" Glycyrrhizæ
" Grindeliæ
" Malti et Ferri
" Paraldehydi
" Picis Compositum
" Pilocarpi
" Quininæ et Phosphatum Compositum
" Rhei
" " et Magnesii Acetatis
" Stillingiæ Compositum
" Turneræ
Emplastrum Ammoniaci
Emplastrum Ammoniaci cum Hydrargyro
" Arnicæ
" Aromaticum
" Asafœtidæ
" Ferri
" Galbani
" Picis Burgundicæ
" " Canadensis
" " Cantharidatum
" " Liquidæ Compositum
" Resinæ
Emulsa Symbolica
Emulsum Ammoniaci
" Olei Morrhuæ cum Calcii et Sodii Phosphatibus
" " Terebinthinæ Fortior
" Phosphaticum
Extractum Aconiti
" Arnicæ Radicis
" Glycyrrhizæ Depuratum
" Iridis
" Juglandis
" Stramonii Seminis
" Uvæ Ursi
Ferri Hypophosphis
" Iodidum Saccharatum
Fluidextractum Arnicæ Radicis
" Aspidospermatis
" Camelliæ
" Coffeæ Viridis
" Cornus Circinatæ
" Cusso
" Malti
" Menispermi
" Menyanthis
" Rhamni Purshianæ Alkalinum
" Stramonii Seminis
" Urticæ
Hydrargyri Subsulphas Flavus
Infusum Gentianæ Compositum Fortius
Lac Humanisatum
Linimentum Cantharidis
" Iodi

Linimentum Plumbi Subacetatis
Liquor Ammonii Acetatis Concentratus
" " Citratis Fortior
" Antigerminarus
" Electropocicus
" Extracti Glycyrrhizæ
" Ferri Iodidi
" Iodi Causticus
" Magnesii Bromidi
" Morphinæ Citratis
" " Hypodermicus
" Saccharini
" Scriparus
" Sodii Carbolatus
" " Olcatis
" Zingiberis
Lotio Adstringens
Magma Magnesiæ
Magnesii Citras Effervescens
Mistura Acaciæ
" Contra Diarrhœam, Loomis
" " " Thielman
" " " Velpeau
" Splenetica
" Sulphurica Acida
Mucilago Cydonii
" Dextrini
" Salep
Oleatum Zinci
Pasta Ichthyoli, Unna
Pepsinum Aromaticum
Pilulæ Antineuralgicæ
" Ferri Compositæ
" Galbani Compositæ
Potassa Sulphurata
Pulveres
Pulvis Acaciæ Compositus
" Amygdalæ Compositus
" Anticatarrhalis
" Ferri et Quininæ Citratis Effervescens
" " Phosphatis Effervescens
" Iodoformi Compositus
" Pepsini Compositus
" pro Lacte Humanisato
Sodii Bicarbonas Saccharatus
" Carbonas Exsiccatus
Spiritus Aromaticus
" Aurantii
" Cardamomi Compositus
Spiritus Curassao
" Limonis
" Myristicæ
" Ophthalmicus
" Phosphori
" Saponatus
Spongia Compressa
" Decolorata
Stilus Cocainæ Dilubilis
Syrupus Chondri Compositus
" Coffeæ
" Ferri Arsenatis
" " Bromidi
" " Citro-Iodidi
" Hypophositum
" Morphinæ Compositus
" " Sulphatis
" Rubi Aromaticus
Tinctura Aconiti, Fleming
" Antacrida
" Arnicæ Radicis
" Chiratæ
" Cinchonæ Detannata
" Conii
" Cresoli Saponata
" Matico
" Papaveris
" Stramonii Seminis
" Tolutana Ætherea
" " Solubilis
" Vanillini Composita
Trochisci Catechu
" Cretæ
" Ferri
" Ipecacuanhæ
" Magnesiæ
" Morphinæ et Ipecacuanhæ
" Sodii Santoninatis
" Zingiberis
Unguentum Acidi Gallici
" Mezerei
" Plumbi Carbonatis
Vinum Album Fortius
" Aloes
" Aurantii
" Carnis, Ferri et Cinchonæ
" Cocæ Aromaticum
" Rhei
Zinci Oleostearas

LIST OF CHANGES IN LATIN TITLES

National Formulary III	National Formulary IV
Acidum Carbolicum Iodatum	Phenol Iodatum
Aqua Sedativa	Lotio Ammoniacalis Camphorata
Campho-Menthol	Menthol Camphoratum
Collodium Iodatum	Collodium Iodi
" Iodoformatum	" Iodoformi
" Salicylatum Compositum	" Salicylici Compositum
Elixir Ammonii Valerianatis	Elixir Ammonii Valeratis
" Cinchonæ	" Cinchonæ Alkaloidorum
" " et Ferri	" Cinchonæ Alkaloidorum et Ferri
" " " Hypophosphitum	" Cinchonæ Alkaloidorum et Hypophosphitum
" Cinchonæ, Ferri, Bismuthi et Strychninæ	" Cinchonæ Alkaloidorum, Ferri, Bismuthi et Strychninæ
" Cinchonæ, Ferri et Bismuthi	" Cinchonæ Alkaloidorum, Ferri et Bismuthi
" Cinchonæ, Ferri et Calcii Lactophosphatis	" Cinchonæ Alkaloidorum, Ferri et Calcii Lactophosphatis
" Cinchonæ, Ferri et Pepsini	" Cinchonæ Alkaloidorum, Ferri et Pepsini
" " " " Strychninæ	" Cinchonæ Alkaloidorum, Ferri et Strychninæ
" Curassao	" Aurantii Amari
" Gentianæ cum Tinctura Ferri Chloridi	" Gentianæ et Ferri
" Glycerophosphatum	" Calcii et Sodii Glycerophosphatum
" Hypophosphitum cum Ferro	" Hypophosphitum et Ferri
" Quininæ Valerianatis et Strychninæ	" Quininæ Valeratis et Strychninæ
" Rhamni Purshianæ	" Cascaræ Sagradæ
" " " Compositum	" " " Compositum
" Strychninæ Valerianatis	" Strychninæ Valeratis
" Terpini Hydratis cum Codeina	" Terpini Hydratis et Codeinæ
" " " " Heroina	" Terpini Hydratis et Diacetylmorphinæ
" Zinci Valerianatis	" Zinci Valeratis
Emulsum Olei Morrhuæ cum Extracto Malti	Emulsum Olei Morrhuæ cum Malto
" Petrolei	" Petrolati
Essentia Pepsini	Elixir Pepsini et Rennini Compositum
Fluidextractum Apii Graveolentis	Fluidextractum Apii Fructus
" Araliæ Racemosæ	" Araliæ
" Arnicæ Florum	" Arnicæ

National Formulary III	National Formulary IV
Fluidextractum Coffeæ Tostæ	Fluidextractum Coffeæ
" Colchici Radicis	" Colchici Cormi
" Convallariæ	" Convallariæ Florum
" Cornus	" Corni
" Coto	" Paracoto
" Gossypii Radicis	" Gossypii Corticis
" Iridis	" Iridis Versicoloris
" Sterculiæ	" Kolæ
" Turneræ	" Damianæ
Liquor Alumini Acetatis	Liquor Alumini Subacetatis
" Coccineus	" Cocci
" Ferri Peptonati cum Mangano	" Ferri Peptonati et Mangani
" Iodi Carbolatis	" Iodi Phenolatus
" Pancreaticus	" Pancreatini
" Potassii Arsenatis et Bromidi	" Arsenicalis, Clemens'
Mistura Adstringens et Escharotica	Mistura Adstringens
" Chloroformi et Cannabis Indicæ Composita	" Chloroformi et Morphinæ Composita
Misturæ Contra Diarrhœam	(1) " Opii et Chloroformi Composita
	(2) " " " Rhei Composita
" Copaibæ	(1) " Copaibæ
	(2) " " et Opii
Mistura Magnesiæ et Asafœtidæ	" Magnesiæ, Asafœtidæ et Opii
" Sassafras et Opii	" Opii et Sassafras
" Sodæ et Menthæ	Liquor Sodæ et Menthæ
Oleum Carbolatum	Oleum Phenolatum
Pasta Naphtholis, Lassar	Pasta Betanaphtholis
" Resorcini Mitis, Lassar	" Resorcinolis Mitis
" Zinci, Lassar	" Zinci
" " Mollis, Unna	" " Mollis
" " Sulphurata, Unna	" " Sulphurata
Petrolatum Saponatum Liquidum	Petroxolinum Liquidum
" " Spissum	" Spissum
Pilulæ Glonoini	Pilulæ Glycerylis Nitratis
" Metallorum	(1) " Ferri, Quininæ, Strychninæ et Arseni Fortiores
	(2) " Ferri, Quininæ, Strychninæ et Arseni Mites
" Quadruplices	" Ferri, Quininæ, Aloes et Nucis Vomicæ
" Triplices	(1) " Aloes, Hydrargyri et Podophylli
	(2) " Aloes, Hydrargyri et Scammonii Compositæ
Pulveres Effervescentes	Salia Effervescentia
Pulvis Catechu Compositus	Pulvis Gambir Compositus
" Cretæ Aromaticus cum Opio	" Cretæ et Opii Aromaticus
" Kino Compositus	" Kino et Opii Compositus

National Formulary III	National Formulary IV
Pulvis Pancreaticus Compositus	Pulvis Pancreatini Compositus
" Potassii Bromidi Effervescens	Sal Potassii Bromidi Effervescens
" Potassii Bromidi Effervescens cum Caffeina	" Potassii Bromidi Effervescens Compositum
" Salis Carolini Factitii Effervescens	" Carolinum Factitium Effervescens
" Salis Kissingensis Factitii Effervescens	" Kissingense Factitium Effervescens
" Salis Vichyani Factitii Effervescens	" Vichyanum Factitium Effervescens
" Salis Vichyani Factitii Effervescens cum Lithio	" Vichyanum Factitium Effervescens cum Lithio
" Talci Salicylicus	Pulvis Talci Compositus
Species Laxantes	Species Laxativæ
Spiritus Myrciæ	Spiritus Myrciæ Compositus
" Olei Volatilis	" Oleorum Volatilum
Stilus Acidi Salicylici Dilubilis	Stili Acidi Salicylici Dilubiles
Succus Limettæ cum Pepsino	Succus Citri et Pepsinum
Syrupus Actææ Compositus	Syrupus Cimicifugæ Compositus
" Calcii Chlorhydrophosphatis	" Calcii Hydrochlorophosphatis
" " Lactophosphatis cum Ferro	" " Lactophosphatis et Ferri
" Hydrochlorophosphatum	" Phosphatum cum Quinina et Strychnina
" Pectoralis	" Morphinæ et Acaciæ
" Pini Strobi Compositus	" Pini Strobi Compositus cum Morphina
" Rhei et Potassii Compositus	Mistura Rhei Alkalina
Tinctura Antiperiodica (I)	Tinctura Antiperiodica sine Aloe
" Coto	" Paracoto
" Iodi, Churchill	" Iodi Fortior
" Kino Composita	" Kino et Opii Composita
" Rhei Vinosa	Vinum Rhei Compositum
" Saponis Viridis Composita	Linimentum Saponis Mollis Compositum
Unguenta Extensa	Mullæ
Unguentum Creosoti Salicylatum Extensum	Mulla Creosoti Salicylata
" Hydrargyri Chloridi Corrosivi Extensum	" Hydrargyri Chloridi Corrosivi
" Salicylatum Extensum	" Acidi Salicylici
" Zinci Extensum	" Zinci
" Resorcini Compositum	Unguentum Resorcinolis Compositum
Vinum Colchici Radicis	Vinum Colchici Cormi
" Fraxini Americanæ	" Fraxini

STERILIZATION

THE term Sterilization, as used in medical or pharmaceutical practice, means a process whereby the destruction or removal of all microscopic living organisms and their spores is accomplished. Some bacteria, under certain conditions, undergo a transformation into a resting stage when they are called spores. In the spore state they are able to resist influences which would kill the bacteria. Most disease-producing bacteria do not form spores and are therefore comparatively easily killed. The anthrax and tetanus bacilli are exceptions to this, as their spores are quite resistant. An object which is free from living micro-organisms is spoken of as being "sterile," but this condition can be maintained only so long as the necessary precautions are taken to prevent contact with the atmosphere or other media or apparatus which may carry micro-organisms.

The uses of sterilization, as applied by pharmacists, are:

1. For the preparation of solutions for hypodermic injection.
2. For the preparation of aseptic medicines for internal or external administration.
3. For the preparation of solutions, dressings, etc., for surgical use.
4. For the preservation of preparations or substances through the destruction of organisms which would otherwise cause deterioration or decomposition.

There are various methods whereby sterilization may be accomplished, and it is necessary that the operator shall select in each case the one which is most suitable.

From the viewpoint of the pharmacist it is important to know:

First.—That most micro-organisms multiply rapidly at temperatures between 20° and 40° C. if there is some nutritive material present.

Second.—If contaminated substances are maintained at a temperature of freezing (0° C.) or below, the development of organisms is retarded but they are not necessarily destroyed.

Third.—All classes of micro-organisms, whether they are bacteria, moulds, yeasts, diatoms or protozoa, also their spores, may be destroyed by practically the same procedure. Any method which will kill all bacterial spores will also destroy every form of life.

Fourth.—Bacteria may develop in almost any substance if sufficient moisture and atmospheric oxygen are present and the temperature is favorable. Some bacteria are anaërobic, that is, they do not require oxygen, and will not survive in its presence.

Yeasts develop in saccharine substances, while moulds develop within and upon a large variety of organic substances. Protozoa and diatoms may occur in water which is highly contaminated with organic matter. Bacteria and moulds do not thrive in sunlight, while diatoms and algæ generally develop best in sunlight.

Fifth.—Bottles, flasks, test tubes, etc., stoppered with purified cotton, then sterilized and kept dry, may be maintained in a sterile condition for an indefinite period. Before opening, however, the orifice should be sterilized by passing it through a Bunsen flame. The exterior of the cotton plug is burned off at the same time, thus destroying bacteria which may have lodged there.

Sixth.—It is desirable that the pharmacist should operate, while preparing sterilized solutions, ointments, etc., under conditions which will avoid the possibility of the contamination of the material, apparatus, etc., by the falling of dust during the operation.

Seventh.—Bottles containing sterilized liquids to be dispensed should be closed with rubber stoppers which have previously been sterilized by boiling for ten minutes in a 5 per cent. phenol solution, then thoroughly rinsed in boiling water and stored in alcohol until used. These should be handled only with large tweezers the tips of which have been sterilized by heating in a Bunsen flame.

Eighth.—Sterilized freshly distilled water should be used in preparing all aqueous solutions. It should be prepared as follows: Place the necessary quantity of freshly distilled water in a flask of Jena or other so-called "non-soluble" glass, which has been previously cleansed and sterilized as described for glassware in Section B. Close the mouth of the flask with a pledget of sterilized purified cotton, boil the contents for thirty minutes, and allow it to cool without removing the cotton plug. Finally protect the mouth of the flask and the cotton stopper from infection with dust by wrapping it in sterilized paper. For use in hypodermic injections only freshly distilled water should be taken, and it should be used within forty-eight hours after sterilization.

The methods by which sterilization may be accomplished are as follows:

A. Direct Flame (Flaming).—It is sometimes possible to make use of the direct application of the Bunsen flame for sterilization, when the object will not be injured. Such objects as platinum needles, dry pipettes, the metallic orifice of a Berkefeld or similar filter, the lip of a bottle or test tube, the points of tweezers or forceps used for handling sterilized rubber stoppers, the walls of a metallic closet, etc., may be rapidly

sterilized by holding them within the Bunsen flame or playing the flame over them a few times.

B. Dry Heat.—This method requires that the object be heated in an oven or suitable apparatus at a temperature of from 160° to 170° C., continued for at least two hours. It is desirable that the object be wrapped in paper so that it may be afterwards handled and stored in a sterile condition. Slight browning or charring of the paper is not objectionable, and is one of the indications that the proper temperature has been reached.

This process may be used for the sterilization of empty bottles, funnels, test tubes, Petri dishes, ointment jars and other glassware, but should not be used for any substance which may be injured by the high temperature required. Before exposing glassware to the heat of the sterilizer it should be dried.

This method may also be used for the sterilization of petrolatum, fixed oils, lard and many powders as talc, kaolin, boric acid, zinc oxide and others which are not injured by this temperature, the precaution being taken, however, to spread them out in a thin stratum, about 6 mm. ($\frac{1}{4}$ inch) in thickness, so that the heat may penetrate.

In sterilizing petrolatum and fixed oils, apply the heat directly to a sand bath carrying the vessel containing the substance, raise the temperature of the oil to 200° C., and then immediately withdraw the heat and protect the sterilized product from contamination. Glycerin should not be heated higher than 150° C. and this temperature should be maintained for one-half hour. Volatile substances, such as Camphor Liniment, for example, should be placed in strong bottles, such as solution of magnesium citrate bottles, the stoppers fastened in, or in sealed ampuls, and the containers and contents heated in an oil bath or a concentrated, aqueous calcium chloride solution to a temperature of about 120° C. for one hour.

Bottles and other glassware which are to be sterilized should be thoroughly cleansed to remove all organic matter, afterwards rinsed with very weak hydrochloric acid (about 0.3 per cent.) to neutralize the alkalinity of the glass, then with distilled water until the washings are neutral and, after drying, stoppered with purified cotton, and finally wrapped in paper and heated for one hour at about 180° C.

C. Moist Heat at 100° C.—The use of live steam for sterilization, usually in an Arnold sterilizer or in a covered kettle or boiler, is more generally applicable than dry heat. On account of the greater penetrating power of steam than that of dry heat a lower temperature is

equally efficient for sterilization. By this process the substance to be sterilized is sometimes heated but once in live steam, the treatment continuing for from thirty minutes to one hour, but "interrupted" or "fractional" sterilization is preferable, due to the fact that many substances are injured by prolonged heating, and especially because organisms may exist in the spore stage and in that condition will not be destroyed by the first heating. For the application of "interrupted" sterilization, the substance is heated in live steam, after the temperature has been raised to 100° C., for fifteen minutes each day on three successive days, the substance being kept during the resting period between the heatings at a temperature of about 20° C. The "moist heat" sterilization at 100° C. may be used for many pharmaceutical solutions, such as some eye waters, gargles, and similar solutions, some medicinal syrups, mucilages, etc. This method may also be used for the sterilization of collapsible metal tubes.

Much of the glassware on the market is relatively quite soluble in water. When solutions are sterilized in glass vessels of this character, a copious precipitate appears on cooling, together with a clouding of the glass, and in the sediment may be seen glistening spicules or thin flakes. It is therefore advisable to use vessels made of one of the varieties of glass known as "non-soluble."

The alkalinity of the glass should be neutralized as described under *B* and, if this has been done, this method may be used in sterilizing solutions for culture media, caffeine, caffeine salicylate, caffeine benzoate, sodium arsenate, sodium cacodylate and the mineral acid salts of strychnine, morphine and cocaine.

D. Steam under Pressure.—For laboratory purposes this form of sterilization has many advantages. Its application by the use of a steam cylinder, known as an autoclave, produces results from one heating of fifteen minutes, under a pressure of one atmosphere (a temperature of about 115° C.), which are more reliable than the method requiring heating at 100° C. each day for three successive days. The higher temperature, however, must again be considered and the method cannot be used for substances which are injured by this degree of heat. The process is well adapted to the sterilization of solutions of stable salts, etc., and of cotton, bandages and many gauzes.

E. Low Temperature (Pasteurization).—This process is carried out in practically the same way as described under *C* (interrupted sterilization with moist heat at 100° C.), except that the temperature is maintained at from 60° to 70° C.

Material to be sterilized at pasteurization temperature is heated on six successive days for from one-half to one hour each day at the temperature indicated above, and during the resting stage between the heatings, kept at about 20° C.

This method is employed when the material to be sterilized is readily decomposed by heat, and it is recommended for the sterilization of solutions of organic salts, alkaloids, alkaloidal salts and such other substances as are subject to decomposition by exposure to a higher temperature.

F. Filtration.—This method, when suitable apparatus is used, affords one of the most practical and efficient processes for preparing sterilized solutions. A Berkefeld or Chamberland filter candle is so arranged that the orifice projects from the bottom of a glass or metallic cylinder, a metallic bell being attached above and around the outlet. To hasten the operation the jar may be arranged so that it can be closed and air pressure applied over the liquid to be filtered. Pressure may be applied by a rubber bulb or hand pump through a tube fitted with a stopcock. When the pressure has been applied the stopcock may be closed and the filtration allowed to proceed.

To use this apparatus it is supported on a tripod or retort stand, the metallic orifice and inside of the bell cover sterilized by the direct application of the Bunsen flame; the lip and cotton stopper of the sterilized vessel also flamed, the cotton plug removed and the bottle slipped over the outlet from the filter. The liquid to be sterilized is then poured into the jar, the pressure applied, and when all of the liquid has filtered into the bottle, the latter is closed with a sterilized stopper.

The apparatus should be taken apart after each operation and the candle filter sterilized in an autoclave or by heating at 100° C. in live steam or boiling water, during one hour. It should be frequently tested by placing the entire candle under water and forcing air through it by means of a rubber bulb or a pump. By this means a break or crack is easily detected.

This device may be used, if the proper precautions are taken, for aqueous solutions such as gargles, eye washes, solutions of alkaloids, etc.

G. Approximate Sterilization.—It may become desirable, when time is not available or when substances are easily injured by heat, to prepare solutions or preparations which are approximately sterile. If this method is to be used it is essential that distilled water, the several sizes of bottles, funnels, filter paper, rubber stoppers, ointment vehicles,

ointment jars, collapsible metal tubes, etc., be kept on hand in a sterile condition.

The operator may conduct the necessary manipulation within a large sheet iron oven, the door of which is open and the interior of which has been sterilized with a Bunsen flame, or under a glass box which has been cleansed with alcohol and chloroform, or under a cloth canopy stretched on a wooden frame, the cloth immediately before use being moistened with 5 per cent. phenol solution. All weighings and operations should be carried out under the protected area. Weighings should be made on glass scale pans which have been first cleansed with alcohol and afterwards with chloroform, or on metallic pans which have been sterilized in a Bunsen flame. If a spatula is to be used it should be treated with alcohol and chloroform or passed through the Bunsen flame several times.

If an aqueous solution is to be prepared the material is weighed and transferred to a sterilized bottle, the mouth of which has been sterilized in the flame before removing the cotton plug, the sterilized water is then added and the bottle stoppered with a sterilized stopper. Chemical salts and other substances which are likely to be used for making sterile preparations by this method should be procured especially for this work, and should be carefully protected from dust and other contamination. If a solution requires filtration this can be done in the protected area, using a sterilized funnel and sterilized cotton or filter paper, which has been thoroughly washed with alcohol. Ointments, powders, etc., may be mixed within the protected space, using sterilized materials, apparatus and containers. It must be remembered that this operation results in only approximate sterility, and that freedom from dust in the room, personal cleanliness of the operator and the most scrupulous care throughout are required for satisfactory results.

H. Sterilization by Means of Chemical Agents.—For the purpose of assisting in sterilization or of protecting substances from subsequent contamination, chemical agents are sometimes employed.

Dependence solely upon chemical germicides demands larger proportions of these than are usually allowable; hence they should be used as adjuncts only, and generally in quantities insufficient to insure sterility in themselves.

When chemical agents are employed, the usual precautions should be observed as to cleansing and sterilizing bottles, graduates, stoppers, etc., and in so far as possible without injury, the substance itself should be sterilized or pasteurized by heat. The chemical agents should only be used to assist in the processes and to hinder subsequent contamination.

This method is frequently used for:

1. The disinfection of the hands and the table before the preparation of a sterile solution.

2. For the disinfection of scale pans and spatula, etc., alcohol and chloroform being used chiefly for this purpose; but sterilization by heat is better.

3. To sterilize large glass vessels that cannot easily be subjected to heat—such as carboys, large bell jars, etc.

4. To maintain in a sterile condition various remedies such as antitoxins, bacterial vaccines, etc.

For the preservation of antitoxins and bacterial vaccines, phenol or cresol is used, the former in the proportion of 0.5 per cent., the latter from 0.25 per cent. to 0.4 per cent. Cresol is from two and a half to three times as strongly germicidal as phenol and scarcely more poisonous. While other chemical germicides may be used, these have been preferred because they are uniform and relatively non-toxic.

It is impossible to set definite limits which will fit all cases for the amounts of the chemical agents which may be employed, because the composition of the substance and its degree of contamination are important factors in sterilization.

Solutions of salts, practically free from organic matter, are easily sterilized, while solutions which contain appreciable though small amounts of organic substances may be difficult to sterilize.

Mineral acids, while objectionable as disinfectants in pharmaceutical preparations, inhibit the development of germs in very weak solutions, and acid solutions sterilize more easily than do neutral or slightly alkaline solutions.

Iodine is one of the most effective of disinfectants, and preparations containing free iodine in material proportions become sterile of themselves. The same is true of solutions containing chlorine or hypochlorites, or bromine. The chlorides, bromides and iodides in general have only very feeble disinfecting power, but the soluble fluorides are active.

The salts of mercury and of silver are active germicides and are among the most important disinfectants for physiological use, but they have specific actions which limit, or may prohibit, their addition to pharmaceuticals for antiseptic or disinfectant purposes. Salts of copper are powerful fungicides, but are feeble antiseptics. Other neutral salts are feebly antiseptic and not generally of value for this purpose.

Peroxides, when under conditions in which they liberate nascent

oxygen, may sterilize, but are useful only in proportion to their own decomposition. Similar powers are attributed to persulphates and permanganates, which act by liberating nascent oxygen, and which require an intimate contact with the substance to be sterilized to be effective.

Of the organic bodies, alcohol stands first in pharmacy as a preservative. Alcohol when present to the extent of from 20 to 40 per cent. by volume is an efficient antiseptic. Solutions containing from 40 to 70 per cent. are actively disinfectant, the latter strength being most efficient. Above 70 per cent. its efficiency tends to diminish, and stronger alcohol may preserve without killing germs.

Formaldehyde is one of the most efficient of disinfectants, and is antiseptic in very small proportions, but may be objectionable for pharmaceutical preparations. Chloroform and bromoform are both active germicides in aqueous solutions, while iodoform is employed medicinally for this one purpose. Thymol iodide is another instance of like character.

Phenol is perhaps the most common of disinfectants, and with cresol is the substance most frequently used in hypodermatic and epidermatic medicaments. These have the advantage of combining activity with stability. Other phenolic compounds, as resorcinol, thymol, betanaphthol, phenyl salicylate (salol), etc., are useful agents and are frequently used in medication for their antiseptic qualities.

A number of the volatile oils, as anise, clove, cinnamon, pine, gaultheria, etc., possess appreciable value as antiseptics, and, while used mainly as flavors, are also employed for their antiseptic properties. Benzoic and salicylic acids are often preferred for internal administration. They are efficient as antiseptics, but are feeble as disinfectants. In foods these are limited to one part per thousand by food commissioners, which is not sufficient for sterilization, but which inhibits the development of most germs.

If the responsibility is thrown upon the pharmacist, the first consideration should be the character of the substance to be sterilized, the presence of antiseptic ingredients, whether active or feeble, being considered, and the action of heat upon it. Heat sterilization should always receive first consideration.

If pasteurization only is allowable, the use of 0.5 per cent. to 1 per cent. of phenol will aid materially in insuring sterility, since all germicides are much more efficient at high than at low temperatures. Cresol in 0.1 to 0.4 per cent. solution is also frequently used. These proportions

may not be sufficient in themselves to produce sterility, but they are aids in securing and maintaining this condition, and are usually preferred in preparations for hypodermatic and epidermatic medication.

For medicines for internal administration hydrogen dioxide, sulphurous, salicylic or benzoic acid or chloroform should be first considered. One part per thousand is the common limit for these, excepting hydrogen dioxide. The latter is often efficient in very small proportions (one in ten thousand), but is slow in action and of little value in mixtures or for preserving preparations used intermittently. It has the advantage of not seriously disturbing digestion.

The use of chemical disinfectants or antiseptics and the problems of sterilization call for judgment and some knowledge of the principles involved. No definite procedure can be recommended which will fit all cases. Success in sterilization must depend, as in other things, upon an intelligent application of principles rather than upon a literal following of arbitrary rules.

SPECIAL NOTICES

TITLE: The title of this book is *The National Formulary, Fourth Edition*, which may be abbreviated as *N.F. IV*.

Standards.—The Food and Drugs Act of June 30, 1906, defines a drug as follows: "The term drug as used in this Act shall include all medicines and preparations recognized in the United States Pharmacopœia or the National Formulary for internal or external use and any substance or mixture of substances intended to be used for the cure, mitigation or prevention of disease of either man or other animals."

In accordance with this definition, the standards described in this National Formulary are intended to apply only to such substances as are used solely for medicinal purposes, or when professedly sold or dispensed for medicinal use. They are not intended to apply to substances sold professedly for technical and non-medicinal uses.

All substances employed in the formulas of this book must conform to the standards of the article under which they are designated in the United States Pharmacopœia or The National Formulary, whether such designation be the official Latin or English title, or a synonym recognized in these works.

Synonyms.—Any substance used or sold under the synonym-name recognized in this book must comply with the standards set for the article under its official title.

Synonyms given under a drug apply with equal force to preparations of that drug. Thus Fluidextract of Pheasant's Eye is the same as Fluidextract of Adonis, Tincture of Marigold is the same as Tincture of Calendula, etc.

Powdered Drugs must conform to the same standards as the corresponding whole drugs.

Test Reagents and Methods of Testing.—All tests and methods of testing in The National Formulary are based upon the reagents and methods of the U. S. Pharmacopœia IX. The standard test-solutions of the Pharmacopœia are to be used in the manner there directed, and for the physical tests, as melting points, boiling points, congealing points, specific gravity, optical rotation, solubilities, the directions specified in Part II of the Pharmacopœia are to be followed.

For convenience, certain of the special tests and more complicated general tests are reproduced in this book by special permission of the

Board of Trustees of the U. S. Pharmacopœia IX, and it is to be noted that these tests are identical with those of the Pharmacopœia.

Molecular weights are calculated from the Table of Atomic Weights in the Pharmacopœia IX (adopted by the International Committee on Atomic Weights, 1915, O = 16) and volumetric solutions are based upon this table.

Optional Factors.—The following statements in the text of The National Formulary are not intended to be literally obligatory, but are recommendatory.

Doses are given as average doses only, and are not to be considered as in any way binding upon the physician, or as forbidding variations in either direction. In so far as the doses herein given are helpful, they may be employed, but physicians are in no degree restricted in their dosage of medicinal substances by the average doses stated in this book.

Abbreviations.—While uniformity in abbreviations is desirable, and a uniform system has been introduced, these are not intended to be standards in a legal sense, and are not to be interpreted as the only abbreviations that may be used.

The abbreviations here adopted are selected partly to avoid ambiguity and partly to promote a standard for words which may and for those which should not be abbreviated. For instance, "sulph." is recommended as an abbreviation for "sulphate," and the words "sulphite" and "sulphide" should not be abbreviated. "Chlor." is proposed for "chloride," and the words "chlorate" and "chlorite" should not be abbreviated. "Phos." is adopted for "phosphate," and the words "phosphite" and "phosphide" are excluded from abbreviation. In all cases which may be considered as doubtful, the abbreviations refer to the most common term used. When the less common terms occur, all doubt will be avoided by using the full word, and this plan is recommended.

Directions for Mixing or Manufacturing.—Under most of the formulas are directions for manipulation to obtain the desired product. These directions have been found convenient and practicable for the quantities directed, and may apply in case of larger or smaller quantities. But such directions admit of deviations which may be more economical or convenient for manufacturing, and changes in the methods are permissible *provided the final product corresponds in all respects with the one produced by the method given.*

Deviations in the formula which result in a change in the composition of the final product are not permissible.

Calculation of Doses in Liquid Preparations

In previous issues of The National Formulary, statements were made under liquid preparations for internal use of the amount of active ingredients or ingredients in each fluidrachm. These statements have been omitted in this issue, but the amounts can be readily calculated by the following rule:

In formulas calling for 1000 milliliters of product, *multiply the quantity of substance in grammes by 8/7 and divide by* 20. *The result is the quantity expressed in grains per fluidrachm.*

Examples.—The formula for Elixir of Ferric Pyrophosphate with Quinine and Strychnine calls for 1000 milliliters of product and contains three active medicinal agents. The dose of each of these per fluidrachm is found as follows

Ferric Pyrophosphate	35.00 Gm. $\times$ 8/7 = 40	$\div$ 20 = 2 grains
Quinine Sulphate	8.75 Gm. $\times$ 8/7 = 10	$\div$ 20 = 0.5 (1/2) grain
Strychnine	0.14 Gm. $\times$ 8/7 = 0.16	$\div$ 20 = 0.008 (1/125) grain

Hence the formula makes a preparation containing 2 grains of ferric pyrophosphate, 1/2 grain of quinine sulphate and 1/125 grain of strychnine in each fluidrachm (or teaspoonful).

The formula for Compound Syrup of Hypophosphites calls for 1000 milliliters of product, and contains seven active medicinal agents. The dose of each of these per fluidrachm is calculated as follows:

Calcium Hypophosphite,	35.00	Gm. $\times$ 8/7 = 40	$\div$ 20 = 2 grains
Potassium Hypophosphite, Sodium Hypophosphite, each,	17.50	Gm. $\times$ 8/7 = 20	$\div$ 20 = 1 grain
Ferric Hypophosphite, Manganese Hypophosphite, each,	2.25	Gm. $\times$ 8/7 = 2.57	$\div$ 20 = 0.128 (approximately 1/8) grain
Quinine	1.10	Gm. $\times$ 8/7 = 1.26	$\div$ 20 = 0.063 (1/16) grain
Strychnine	0.115	Gm. $\times$ 8/7 = 0.131	$\div$ 20 = 0.0065 (approximately 1/160) grain

Note that the formula must call for 1000 milliliters of product, or be calculated for that amount. For example, Solution of Mercury and Potassium Iodide (p. 121) calls for 250 milliliters of product and must be calculated as follows:

Red Mercury Iodide 2.5 Gm. $\times$ 4 = 10 Gm. $\times$ 8/7 = 11.43 $\div$ 20 = 0.571 grain per fluidrachm.

Likewise Solution of Phosphorus (p. 128) calls for 100 milliliters of solution, and is calculated as follows:

Phosphorus 0.07 Gm. $\times 10 = 0.7 \times \frac{8}{7} = 0.8 \div 20 = 0.04$ ($\frac{1}{25}$) grain per fluidrachm.

The above method gives accurate results. If approximate results only are sufficient, they can be obtained more easily by multiplying the quantity in grammes by 0.06. For example: Using the same formulas as above,

Ferric Pyrophosphite	35.00	Gm. $\times$ .06 = 2.10 grains per fluidrachm
Quinine Sulphate	8.75	Gm. $\times$ .06 = 0.525 grain per fluidrachm
Strychnine	0.14	Gm. $\times$ .06 = 0.0084 grain per fluidrachm

or for the hypophosphites:

Calcium Hypophosphite	35.00	Gm. $\times$ .06 = 2.10 grains per fluidrachm
Potassium Hypophosphite	17.50	Gm. $\times$ .06 = 1.05 grain per fluidrachm
Ferric Hypophosphite	2.25	Gm. $\times$ .06 = 0.135 grain per fluidrachm
Quinine	1.10	Gm. $\times$ .06 = 0.066 grain per fluidrachm
Strychnine	0.115	Gm. $\times$ .06 = 0.0069 grain per fluidrachm

It will be noted that the above results are *five per cent. in excess* of the truth, but they are convenient for rapid calculation. The first method is recommended for accurate results.

THE NATIONAL FORMULARY

PART I

ACETUM AROMATICUM

Aromatic Vinegar

Acet. Arom.

Oil of Lavender, *five-tenths of a milliliter*	0.5 mil
Oil of Rosemary, *five-tenths of a milliliter*	0.5 mil
Oil of Juniper, *five-tenths of a milliliter*	0.5 mil
Oil of Peppermint, *five-tenths of a milliliter*	0.5 mil
Oil of Cinnamon, *five-tenths of a milliliter*	0.5 mil
Oil of Lemon, *one milliliter*	1.0 mil
Oil of Clove, *one milliliter*	1.0 mil
Alcohol, *two hundred and fifty milliliters*	250.0 mils
Acetic Acid, *two hundred and sixty milliliters*	260.0 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the oils in the alcohol, add the acetic acid, and lastly enough water to make the product measure *one thousand milliliters.* Set the mixture aside for eight days, occasionally agitating it and then filter.

ACETUM OPII

Vinegar of Opium

(U.S.P. VIII)

Acet. Opii

Granulated Opium, *one hundred grammes*	100 Gm.
Myristica, in No. 30 powder, *thirty grammes*	30 Gm.
Sugar, *two hundred grammes*	200 Gm.
Diluted Acetic Acid, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Macerate the opium, myristica and sugar in *five hundred milliliters* of diluted acetic acid during seven days, frequently shaking the mixture; then transfer it to a cylindrical percolator in the neck of which has been placed a pledget of purified cotton. Allow the percolation to proceed

slowly until the liquid has entirely disappeared from the surface, then gradually pour on diluted acetic acid and continue the percolation until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 0.5 mil—Apothecaries, 8 minims.

AQUA PHENOLATA

Phenolated Water

Aq. Phenol. Phenoli Solutio, P.I. Carbolic Acid Water

Liquefied Phenol, *twenty-two milliliters*	22 mils
Distilled Water, *nine hundred and seventy-eight milliliters*	978 mils
To make *one thousand milliliters*	1000 mils

Mix.

CAFFEINÆ SODIO-SALICYLAS

Caffeine Sodio-Salicylate

Caff. Sod.-Sal.

Caffeine, *fifty grammes*	50 Gm.
Sodium Salicylate, *fifty grammes*	50 Gm.
Alcohol, *a sufficient quantity,*	
To make about *one hundred grammes*	100 Gm.

Triturate the caffeine with the sodium salicylate and a sufficient quantity of alcohol to produce a smooth paste and dry this by exposure to air in a moderately warm place. Reduce the dry mass to powder and keep it in well-stoppered bottles.

AVERAGE DOSE—Metric, 0.2 Gm.—Apothecaries, 3 grains.

CATAPLASMA KAOLINI

Cataplasm of Kaolin

(U.S.P. VIII)

Catapl. Kaolin.

Kaolin, recently dried at 110° C. and cooled, and in very fine powder, *five hundred and sixty-five grammes*	565.0 Gm.
Boric Acid, in very fine powder, *forty-five grammes*	45.0 Gm.
Thymol, *five-tenths of a gramme*	0.5 Gm.
Methyl Salicylate, *two grammes*	2.0 Gm.
Oil of Peppermint, *five-tenths of a gramme*	0.5 Gm.
Glycerin, recently heated to 100° C., *three hundred and eighty-seven grammes*	387.0 Gm.
To make about *one thousand grammes*	1000 Gm.

Mix the kaolin with the boric acid, and then thoroughly incorporate the warm glycerin. Finally add the thymol, dissolved in the methyl salicylate and oil of peppermint, and make into a homogeneous mass. Preserve it in air-tight containers.

CERATUM CAMPHORÆ

Camphor Cerate

(U.S.P. VIII)

Cerat. Camph.

Camphor Liniment, *one hundred grammes*	**100 Gm.**
White Wax, *three hundred and fifty grammes*	**350 Gm.**
White Petrolatum, *one hundred and fifty grammes*	**150 Gm.**
Benzoinated Lard, *four hundred grammes*	**400 Gm.**
To make *one thousand grammes*	**1000 Gm.**

Melt the white wax, add the white petrolatum, then the benzoinated lard, and continue the heat until the mixture is liquefied. Add the camphor liniment and stir the mixture until it congeals.

CERATUM PLUMBI SUBACETATIS

Cerate of Lead Subacetate

(U.S.P. VIII)

Cerat. Plumb. Subacet. Goulard's Cerate

Solution of Lead Subacetate, *twenty grammes*	**20 Gm.**
Wool Fat, *twenty grammes*	**20 Gm.**
White Wax, *twenty grammes*	**20 Gm.**
White Petrolatum, *thirty-eight grammes*	**38 Gm.**
Camphor, *two grammes*	**2 Gm.**
To make *one hundred grammes*	**100 Gm.**

Melt the white petrolatum and white wax in a dish on a water bath, remove the heat and dissolve the camphor in the warm mixture. Add the wool fat, mix thoroughly and then gradually incorporate the solution of lead subacetate by continuous stirring.

CERATUM RESINÆ COMPOSITUM

Compound Rosin Cerate

(U.S.P. VIII)

Cerat. Resin. Co.	Deshler's Salve
Rosin, *two hundred and twenty-five grammes*	225 Gm.
Yellow Wax, *two hundred and twenty-five grammes*	225 Gm.
Prepared Suet, *three hundred grammes*	300 Gm.
Turpentine, *one hundred and fifteen grammes*	115 Gm.
Linseed Oil, *one hundred and thirty-five grammes*	135 Gm.
To make about *one thousand grammes*	1000 Gm.

Melt the rosin, yellow wax, turpentine, and prepared suet, add the linseed oil, and continue the heat until the mixture is liquefied. Strain it through coarse muslin, stirring until it begins to congeal.

CHARTA POTASSII NITRATIS

Potassium Nitrate Paper

Chart. Pot. Nit.

Potassium Nitrate, *two hundred grammes*	200 Gm.
Water, *eight hundred milliliters*	800 mils

Dissolve the potassium nitrate in the water. Immerse strips of white, unsized paper in the solution, and dry them.

Keep the paper in well-closed containers.

CHLORAL CAMPHORATUM

Camphorated Chloral

Chloral Camph.

Hydrated Chloral, *fifty grammes*	50 Gm.
Camphor, *fifty grammes*	50 Gm.
To make *one hundred grammes*	100 Gm.

Place the camphor and hydrated chloral in a suitable bottle. Stopper the bottle and warm it in a water bath, with frequent agitation, until the mixture is liquefied.

COLLODIUM IODI

Iodine Collodion

Collod. Iodi Collodium Iodatum, N.F. III

Iodine, reduced to powder, *five grammes*	**5 Gm.**
Flexible Collodion, *ninety-five grammes*	**95 Gm.**
To make *one hundred grammes*	**100 Gm.**

Add the iodine to the flexible collodion in a bottle and agitate the mixture frequently until the iodine is dissolved.

COLLODIUM IODOFORMI

Iodoform Collodion

Collod. Iodof. Collodium Iodoformatum, N.F. III

Iodoform, in fine powder, *five grammes*	**5 Gm.**
Flexible Collodion, *ninety-five grammes*	**95 Gm.**
To make *one hundred grammes*	**100 Gm.**

Add the iodoform to the flexible collodion in a bottle and agitate the mixture until the iodoform is dissolved.

COLLODIUM SALICYLICUM COMPOSITUM

Compound Salicylic Collodion

Collod. Salicyl. Co. Collodium Salicylatum Compositum, N.F. III

Salicylic Acid, *eleven grammes*	**11 Gm.**
Fluidextract of Cannabis, *ten grammes*	**10 Gm.**
Flexible Collodion, *a sufficient quantity,*	
To make *one hundred grammes*	**100 Gm**

Dissolve the salicylic acid in *seventy-five grammes* of flexible collodion in a tared bottle. Add the fluidextract of cannabis and finally enough flexible collodion to make the product weigh *one hundred grammes.*

COLLODIUM STYPTICUM

Styptic Collodion

(Replacing U.S.P. VIII)

Collod. Stypt.

Tannic Acid, *twenty grammes*	**20 Gm.**
Flexible Collodion, *eighty grammes*	**80 Gm.**
To make *one hundred grammes*	**100 Gm.**

Add the tannic acid to the flexible collodion in a bottle and agitate the mixture until the tannic acid is dissolved.

COLLODIUM TIGLII

Croton Oil Collodion

Collod. Tiglii

Croton Oil, *ten grammes*	10 Gm.
Flexible Collodion, *ninety grammes*	90 Gm.
To make *one hundred grammes*	100 Gm.

Mix them.

CONFECTIO ROSÆ

Confection of Rose

(U.S.P. VIII)

Confect. Ros.

Red Rose, in No. 60 powder, *eighty grammes*	80 Gm.
Sugar, in fine powder, *six hundred and forty grammes*	640 Gm.
Clarified Honey, *one hundred and twenty grammes*	120 Gm.
Stronger Rose Water, *one hundred and sixty milliliters*	160 mils
To make about *one thousand grammes*	1000 Gm.

Rub the red rose with the stronger rose water previously heated to 65° C., then gradually add the sugar and clarified honey, and knead it until a uniform mass is obtained.

CONFECTIO SENNÆ

Confection of Senna

(U.S.P. VIII)

Confect. Senn.

Senna, in No. 60 powder, *one hundred grammes*	100 Gm.
Cassia Fistula, bruised, *one hundred and sixty grammes*	160 Gm.
Tamarind, *one hundred grammes*	100 Gm.
Prune, sliced, *seventy grammes*	70 Gm.
Fig, bruised, *one hundred and twenty grammes*	120 Gm.
Sugar, in fine powder, *five hundred and fifty-five grammes*	555 Gm.
Oil of Coriander, *five grammes*	5 Gm.
Water, *a sufficient quantity,*	
To make *one thousand grammes*	1000 Gm.

Digest the cassia fistula, tamarind, prune and fig with *five hundred milliliters* of water in a covered vessel, on a water bath, for three hours.

Rub the pulpy mass, first through a coarse sieve, and then through a muslin cloth. Mix the residues with *one hundred and fifty milliliters* of water, digest the mixture for a short time, then treat it as before, and add the strained product to the pulpy mass first obtained. Then, by means of a water bath, dissolve the sugar in the mixture, and evaporate it, in a tared vessel, until it weighs *eight hundred and ninety-five grammes*. Lastly, add the senna and the oil of coriander, and incorporate them thoroughly with the other ingredients while they are yet warm.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 60 grains.

CORDIALE RUBI FRUCTUS

Blackberry Cordial

Cord. Rubi Fruct.

Saigon Cinnamon, in No. 40 powder, *twenty grammes*	**20 Gm.**
Clove, in No. 40 powder, *five grammes*	**5 Gm.**
Myristica, in No. 40 powder, *five grammes*	**5 Gm.**
Purified Talc, *eight grammes*	**8 Gm.**
Syrup of Blackberry Fruit,	
Diluted Alcohol, each, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Pack the mixed drugs firmly in a cylindrical glass percolator and pour on diluted alcohol until the percolate measures *two hundred and fifty milliliters;* to this add sufficient syrup of blackberry fruit to make the product measure *one thousand milliliters,* mix, add the purified talc and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

DECOCTUM SARSAPARILLÆ COMPOSITUM

Compound Decoction of Sarsaparilla

Decoc. Sarsap. Co.

Sarsaparilla, cut and bruised, *one hundred grammes*	**100 Gm.**
Sassafras, in No. 20 powder, *twenty grammes*	**20 Gm.**
Guaiac Wood, rasped, *twenty grammes*	**20 Gm.**
Glycyrrhiza, cut and bruised, *twenty grammes*	**20 Gm.**
Mezereum, cut and bruised, *ten grammes*	**10 Gm.**
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Add the sarsaparilla and guaiac wood to *one thousand milliliters* of water in a suitable vessel and boil the mixture for thirty minutes, replacing the water lost by evaporation. Then add the sassafras, glycyrrhiza and mezereum, cover the vessel, and macerate the mixture for two hours. Finally strain, and add enough cold water, through the strainer, to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 120 mils—Apothecaries, 4 fluidounces.

ELIXIRIA

Elixirs

The elixirs for which formulas are herein given should be, without exception, perfectly clear preparations when dispensed.

If, for any reason, an elixir becomes turbid on keeping, filter it through paper, or otherwise clarify it. To secure a brilliantly clear filtrate, it is recommended that the turbid elixir be shaken with a little purified talc, or purified siliceous earth before filtration, 10 to 25 Gm. sufficing for each 1000 mils.

While it is obligatory to use materials of accepted purity and quality for all medicines, it must be remembered that no class of preparations calls for greater care in the selection of the ingredients from which they are to be made than does that of elixirs; this is particularly true with reference to the flavoring substances, mainly volatile oils, which must be absolutely fresh and of the finest quality if satisfactory products are to be obtained.

Elixirs must not be exposed to extremes of temperature. Preserve them in tightly-stoppered bottles at the ordinary room temperature.

ELIXIR AMMONII BROMIDI

Elixir of Ammonium Bromide

Elix. Ammon. Brom.

Ammonium Bromide, *eighty-five grammes*	**85 Gm.**
Syrup, *two hundred milliliters*	**200 mils**
Distilled Water, *four hundred and sixty milliliters*	**460 mils**
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the ammonium bromide in the distilled water, add the syrup and sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR AMMONII VALERATIS

Elixir of Ammonium Valerate

Elix. Ammon. Valer. Elixir Ammonii Valerianatis, N.F. III

Ammonium Valerate, *thirty-five grammes*	35.0 Gm.
Chloroform, *one and five-tenths milliliters*	1.5 mils
Tincture of Vanilla, *sixteen milliliters*	16.0 mils
Compound Tincture of Cudbear, *sixteen milliliters*	16.0 mils
Ammonia Water,	
Aromatic Elixir, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the ammonium valerate in about *sixty-five milliliters* of aromatic elixir and add ammonia water, in drops, until a faint excess of it is perceptible in the liquid, using litmus paper as an indicator. Then add the chloroform, tincture of vanilla and compound tincture of cudbear, and enough aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR AMYGDALÆ COMPOSITUM

Compound Elixir of Almond

Elix. Amygdal. Co.

Oil of Bitter Almond, *five-tenths of a milliliter*	0.5 mil
Vanillin, *one gramme*	1.0 Gm.
Stronger Orange Flower Water, *one hundred and fifty milliliters*	150.0 mils
Alcohol, *fifty milliliters*	50.0 mils
Syrup, *four hundred milliliters*	400.0 mils
Purified Talc, *twenty grammes*	20.0 Gm.
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the oil of bitter almond and the vanillin in the alcohol, add the syrup, the stronger orange flower water and then sufficient distilled water, in several portions, shaking the mixture thoroughly after each addition, to make the product measure *one thousand milliliters.* Finally incorporate the purified talc and filter the mixture, returning the first portions of the filtrate until it passes through clear.

ELIXIR ANISI

Elixir of Anise

Elix. Anis.

Anethol, *three and five-tenths milliliters*	3.5 mils
Oil of Fennel, *five-tenths of a milliliter*	0.5 mil
Spirit of Bitter Almond, *twelve milliliters*	12.0 mils
Alcohol, *two hundred and forty milliliters*	240.0 mils
Syrup, *six hundred and twenty-five milliliters*	625.0 mils
Purified Talc, *twenty grammes*	20.0 Gm.
Distilled Water, *a sufficient quantity,*	
To make about *one thousand milliliters*	1000 mils

Mix the anethol, oil, and spirit of bitter almond with the alcohol, add the syrup and sufficient distilled water to make the product measure *one thousand milliliters.* Add the purified talc and set the mixture aside for twelve hours. Then cool it to about 15° C. and filter, returning the first portions of the filtrate until it runs through clear.

AVERAGE DOSE—For infants, Metric, 1 mil—Apothecaries, 15 minims.

ELIXIR AROMATICUM RUBRUM

Red Aromatic Elixir

Elix. Arom. Rub. Red Elixir

Cudbear, *two grammes*	2 Gm.
Aromatic Elixir, *one thousand milliliters*	1000 mils
To make *one thousand milliliters*	1000 mils

Add the cudbear to the aromatic elixir, in a suitable container, allow the mixture to stand for six hours with occasional agitation and then filter.

ELIXIR AURANTII AMARI

Elixir of Bitter Orange

Elix. Aurant. Amar.

(To replace Elixir Curassao, N.F. III)

Oil of Bitter Orange, *four milliliters*	4 mils
Tincture of Bitter Orange Peel, *twenty milliliters*	20 mils
Alcohol, *three hundred milliliters*	300 mils
Stronger Orange Flower Water, *twenty milliliters*	20 mils
Syrup, *four hundred milliliters*	400 mils
Purified Talc, *twenty grammes*	20 Gm.
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the oil of bitter orange and the tincture of bitter orange peel with the alcohol, add the syrup, the stronger orange flower water and then sufficient distilled water, in several portions, shaking the mixture after each addition, to make the product measure *one thousand milliliters*. Finally incorporate the purified talc and filter the mixture, returning the first portions of the filtrate until it passes through clear.

ELIXIR BISMUTHI

Elixir of Bismuth

Elix. Bismuth.

Glycerite of Bismuth, *one hundred and twenty-five milliliters*	125 mils
Glycerin, *one hundred and twenty-five milliliters*	125 mils
Distilled Water, *two hundred and fifty milliliters*	250 mils
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the ingredients in the order given and filter the product.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR BUCHU

Elixir of Buchu

Elix. Buchu

Fluidextract of Buchu, *one hundred and twenty-five milliliters*	125 mils
Alcohol, *fifty milliliters*	50 mils
Purified Talc, *twenty grammes*	20 Gm.
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the fluidextract of buchu with the alcohol and then add sufficient aromatic elixir to make *one thousand milliliters* and add the purified talc. Shake the mixture occasionally during twelve hours and then filter, returning the first portions of filtrate until it passes through clear.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR BUCHU COMPOSITUM

Compound Elixir of Buchu

Elix. Buchu Co.

Compound Fluidextract of Buchu, *two hundred and fifty milliliters*	250 mils
Purified Talc, *twenty grammes*	20 Gm.
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the compound fluidextract of buchu with sufficient aromatic elixir to make *one thousand milliliters,* add the purified talc and mix thoroughly. Shake the mixture occasionally during twelve hours and filter, returning the first portions of the filtrate until it passes through clear.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR BUCHU ET POTASSII ACETATIS

Elixir of Buchu and Potassium Acetate

Elix. Buchu et Pot. Acet.

Potassium Acetate, *eighty-five grammes*	85 Gm.
Elixir of Buchu, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the potassium acetate in sufficient elixir of buchu to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR CALCII BROMIDI

Elixir of Calcium Bromide

Elix. Calc. Brom.

Calcium Bromide, *eighty-five grammes*	85 Gm.
Diluted Hydrobromic Acid, *four milliliters*	4 mils
Syrup, *two hundred milliliters*	200 mils
Distilled Water, *four hundred and sixty milliliters*	460 mils
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the calcium bromide in the distilled water to which has been added the diluted hydrobromic acid, add the syrup and sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR CALCII ET SODII GLYCEROPHOSPHATUM

Elixir of Calcium and Sodium Glycerophosphates

Elix. Calc. et Sod. Glycerophos. Elixir Glycerophosphatum, N.F. III

Solution of Sodium Glycerophosphate, *twenty-five grammes*	**25.00 Gm.**
Calcium Glycerophosphate, *eight and seventy-five hundredths grammes*	**8.75 Gm.**
Phosphoric Acid, *eight milliliters*	**8.00 mils**
Glycerin, *three hundred milliliters*	**300.00 mils**
Aromatic Elixir, *three hundred milliliters*	**300.00 mils**
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the glycerophosphates in the acid and *three hundred milliliters* of distilled water, add the glycerin and aromatic elixir, and finally enough distilled water to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR CALCII HYPOPHOSPHITIS

Elixir of Calcium Hypophosphite

Elix. Calc. Hypophos.

Calcium Hypophosphite, *thirty-five grammes*	**35 Gm.**
Hypophosphorous Acid, *four milliliters*	**4 mils**
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the calcium hypophosphite in *seven hundred and fifty milliliters* of aromatic elixir to which has been added the hypophosphorous acid; then add sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR CALCII LACTOPHOSPHATIS

Elixir of Calcium Lactophosphate

Elix. Calc. Lactophos.

Precipitated Calcium Carbonate, *ten grammes*	10 Gm.
Lactic Acid, *thirty milliliters*	30 mils
Phosphoric Acid, *fifteen milliliters*	15 mils
Compound Spirit of Orange, *ten milliliters*	10 mils
Syrup, *three hundred and fifty milliliters*	350 mils
Alcohol, *two hundred milliliters*	200 mils
Purified Talc, *twenty grammes*	20 Gm.
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the precipitated calcium carbonate in the lactic acid, which has been previously mixed with *two hundred milliliters* of distilled water, and then add the phosphoric acid, diluted with *fifty milliliters* of distilled water. To this solution add the syrup and then, in divided portions, the mixture of alcohol and compound spirit of orange. Now add sufficient distilled water to make the product measure *one thousand milliliters,* then add the purified talc and filter, returning the first portions of the filtrate until it passes through clear.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR CARDAMOMI COMPOSITUM

Compound Elixir of Cardamom

Elix. Card. Co.

Compound Spirit of Cardamom, *ten milliliters*	10 mils
Alcohol, *ninety milliliters*	90 mils
Syrup, *four hundred milliliters*	400 mils
Purified Talc, *twenty grammes*	20 Gm.
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the compound spirit of cardamom with the alcohol, add the syrup and then sufficient distilled water, in several portions, shaking the mixture thoroughly after each addition, to make the product measure *one thousand milliliters.* Then add the purified talc and filter, returning the first portions of the filtrate until it passes through clear.

ELIXIR CASCARÆ SAGRADÆ

Elixir of Cascara Sagrada

Elix. Casc. Sag. Elixir Rhamni Purshianæ, N.F. III

Aromatic Fluidextract of Cascara Sagrada, *five hundred milliliters*	500 mils
Aromatic Elixir, *five hundred milliliters*	500 mils
To make *one thousand milliliters*	1000 mils

Mix them, allow the mixture to stand over night and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR CASCARÆ SAGRADÆ COMPOSITUM

Compound Elixir of Cascara Sagrada

Elix. Casc. Sag. Co. Elixir Rhamni Purshianæ Compositum, N.F. III
Laxative Elixir

Aromatic Fluidextract of Cascara Sagrada, *one hundred and twenty-five milliliters*	125 mils
Fluidextract of Senna, *seventy-five milliliters*	75 mils
Fluidextract of Juglans, *sixty-five milliliters*	65 mils
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix them, allow the mixture to stand over night and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR CATHARTICUM COMPOSITUM

Compound Cathartic Elixir

Elix. Cathart. Co.

Fluidextract of Frangula, *one hundred and twenty-five milliliters*	125.0 mils
Fluidextract of Senna, *one hundred milliliters*	100.0 mils
Fluidextract of Rhubarb, *sixty-two milliliters*	62.0 mils
Spirit of Peppermint, *fourteen milliliters*	14.0 mils
Solution of Potassium Hydroxide, *four and five-tenths milliliters*	4.5 mils
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix *six hundred milliliters* of aromatic elixir with the solution of potassium hydroxide; then add the fluidextracts, the spirit of peppermint, and sufficient aromatic elixir to make the product measure *one thousand milliliters*. Allow the mixture to stand twenty-four hours, and filter.

	Metric	Apothecaries
AVERAGE DOSE—Aperient,	4 mils	1 fluidrachm.
Cathartic,	12 mils	3 fluidrachms.

ELIXIR CINCHONÆ ALKALOIDORUM

Elixir of Cinchona Alkaloids

Elix. Cinchon. Alk. Elixir Cinchonæ, N.F. III Elixir Calisaya, Alkaloidal

Quinine Sulphate, *two grammes*	2 Gm.
Cinchonidine Sulphate, *one gramme*	1 Gm.
Cinchonine Sulphate, *one gramme*	1 Gm.
Compound Tincture of Cudbear, *fifty milliliters*	50 mils
Purified Talc, *twenty grammes*	20 Gm.
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the alkaloidal salts in *nine hundred milliliters* of aromatic elixir; add the compound tincture of cudbear and sufficient aromatic elixir to make the product measure *one thousand milliliters*. Then add the purified talc and mix well. Allow the mixture to stand several hours, with occasional shaking, and then filter, returning the first portions of the filtrate until it passes through clear.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR CINCHONÆ ALKALOIDORUM ET FERRI

Elixir of Cinchona Alkaloids and Iron

Elix. Cinchon. et Ferr.

Elixir Cinchonæ et Ferri, N.F. III Ferrated Elixir of Calisaya, Alkaloidal

Ferric Phosphate, *thirty-five grammes*	35 Gm.
Distilled Water, *sixty milliliters*	60 mils
Elixir of Cinchona Alkaloids, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the ferric phosphate in the distilled water with the aid of heat, and add a sufficient quantity of the elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR CINCHONÆ ALKALOIDORUM ET HYPOPHOSPHITUM

Elixir of Cinchona Alkaloids and Hypophosphites

Elix. Cinchon. et Hypophos.

Elixir Cinchonæ et Hypophosphitum, N.F. III Elixir of Calisaya, Alkaloidal, with Hypophosphites

Calcium Hypophosphite, *seventeen and five-tenths grammes* . .	17.5 Gm.
Sodium Hypophosphite, *seventeen and five-tenths grammes* . .	17.5 Gm.
Hypophosphorous Acid, *eight milliliters*	8.0 mils
Distilled Water, *one hundred and twenty-five milliliters*	125.0 mils
Elixir of Cinchona Alkaloids, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the hypophosphites in the distilled water, to which has been added the hypophosphorous acid, then add sufficient of the elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR CINCHONÆ ALKALOIDORUM, FERRI, BISMUTHI ET STRYCHNINÆ

Elixir of Cinchona Alkaloids, Iron, Bismuth and Strychnine

Elix. Cinchon. Ferr. Bism. et Strych.

Elixir Cinchonæ, Ferri, Bismuthi et Strychninæ, N.F. III Elixir of Calisaya, Alkaloidal, with Iron, Bismuth and Strychnine

Strychnine Sulphate, *one hundred and seventy-five milligrammes*	0.175 Gm.
Distilled Water, *ten milliliters*	10.000 mils
Elixir of Cinchona Alkaloids, Iron and Bismuth, *a sufficient quantity,*	
To make *one thousand milliliters* . . .	1000 mils

Dissolve the strychnine sulphate in the distilled water, add sufficient of the elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR CINCHONÆ ALKALOIDORUM, FERRI ET BISMUTHI

Elixir of Cinchona Alkaloids, Iron and Bismuth

Elix. Cinchon. Ferr. et Bism.

Elixir Cinchonæ, Ferri et Bismuthi, N.F. III Elixir of Calisaya, Alkaloidal, with Iron and Bismuth

Glycerite of Bismuth, *sixty-five milliliters*	65 mils
Distilled Water, *sixty-five milliliters*	65 mils
Elixir of Cinchona Alkaloids and Iron, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dilute the glycerite with the distilled water, add sufficient of the elixir to make the product measure *one thousand milliliters*, mix thoroughly and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR CINCHONÆ ALKALOIDORUM, FERRI ET CALCII LACTOPHOSPHATIS

Elixir of Cinchona Alkaloids, Iron and Calcium Lactophosphate

Elix. Cinchon. Ferr. et Calc. Lactophos.

Elixir Cinchonæ, Ferri et Calcii Lactophosphatis, N.F. III Elixir of Calisaya, Iron and Lactophosphate of Lime

Syrup of Calcium Lactophosphate, *five hundred milliliters*	500 mils
Potassium Citrate, *thirty grammes*	30 Gm.
Elixir of Cinchona Alkaloids and Iron, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the potassium citrate in *four hundred and fifty milliliters* of elixir of cinchona alkaloids and iron, add the syrup and finally enough of the elixir to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR CINCHONÆ ALKALOIDORUM, FERRI ET PEPSINI

Elixir of Cinchona Alkaloids, Iron and Pepsin

Elix. Cinchon. Ferr. et Pepsin.

Elixir Cinchonæ, Ferri et Pepsini, N.F. III Elixir of Calisaya, Alkaloidal, with Iron and Pepsin

Glycerite of Pepsin, *two hundred milliliters* . . . . . 200 mils
Elixir of Cinchona Alkaloids and Iron, *a sufficient quantity,*
To make *one thousand milliliters* . . . . . 1000 mils

Mix them and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR CINCHONÆ ALKALOIDORUM, FERRI ET STRYCHNINÆ

Elixir of Cinchona Alkaloids, Iron and Strychnine

Elix. Cinchon. Ferr. et Strych.

Elixir Cinchonæ, Ferri et Strychninæ, N.F. III Elixir of Calisaya, Alkaloidal, with Iron and Strychnine

Strychnine Sulphate, *one hundred and seventy-five milligrammes* 0.175 Gm.
Distilled Water, *ten milliliters* . . . . . 10.000 mils
Elixir of Cinchona Alkaloids and Iron, *a sufficient quantity,*
To make *one thousand milliliters* . . . 1000 mils

Dissolve the strychnine sulphate in the distilled water, add sufficient of the elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR CORYDALIS COMPOSITUM

Compound Elixir of Corydalis

Elix. Coryd. Co.

Fluidextract of Corydalis, *sixty milliliters* . . . . . 60 mils
Fluidextract of Stillingia, *sixty milliliters* . . . . . 60 mils
Fluidextract of Xanthoxylum, *thirty milliliters* . . . . . 30 mils
Fluidextract of Blue Flag, *ninety milliliters* . . . . . 90 mils
Alcohol, *one hundred and twenty-five milliliters* . . . . . 125 mils
Potassium Iodide, *fifty grammes* . . . . . 50 Gm.
Aromatic Elixir, *a sufficient quantity,*
To make *one thousand milliliters* . . . . . 1000 mils

Mix the fluidextracts, add the alcohol and dissolve the potassium iodide in the mixture. Then add sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR ERIODICTYI AROMATICUM

Aromatic Elixir of Eriodictyon

Elix. Eriodict. Arom. Aromatic Elixir of Yerba Santa Elixir Corrigens

Fluidextract of Eriodictyon, *sixty milliliters*	60 mils
Syrup, *five hundred milliliters*	500 mils
Pumice, in fine powder, *thirty grammes*	30 Gm.
Magnesium Carbonate, *ten grammes*	10 Gm.
Compound Elixir of Taraxacum, *four hundred and forty milliliters*	440 mils
To make *one thousand milliliters*	1000 mils

Triturate the fluidextract with the pumice and the magnesium carbonate and gradually add the elixir, followed by the syrup. Then shake the mixture frequently during two hours, allow it to stand over night and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR FERRI HYPOPHOSPHITIS

Elixir of Ferric Hypophosphite

Elix. Ferr. Hypophos.

Ferric Hypophosphite, *sixteen and five-tenths grammes*	16.5 Gm.
Potassium Citrate, *twenty-one and five-tenths grammes*	21.5 Gm.
Distilled Water, *thirty-five milliliters*	35.0 mils
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the potassium citrate in the distilled water, add the ferric hypophosphite and heat the mixture gently until a clear solution is obtained. Then add sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR FERRI LACTATIS

Elixir of Iron Lactate

Elix. Ferr. Lact.

Ferrous Lactate, *seventeen and five-tenths grammes*	**17.5 Gm.**
Potassium Citrate, *fifty-two and five-tenths grammes*	**52.5 Gm.**
Distilled Water, *one hundred and twenty milliliters*	**120.0 mils**
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the ferrous lactate and potassium citrate in the distilled water with the aid of a gentle heat. Then add enough aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR FERRI PHOSPHATIS

Elixir of Ferric Phosphate

Elix. Ferr. Phos.

Ferric Phosphate, *thirty-five grammes*	**35 Gm.**
Distilled Water, *sixty milliliters*	**60 mils**
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the ferric phosphate in the distilled water with the aid of heat; then mix this solution with sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR FERRI PYROPHOSPHATIS

Elixir of Ferric Pyrophosphate

Elix. Ferr. Pyrophos. Elixir of Pyrophosphate of Iron

Ferric Pyrophosphate, *thirty-five grammes*	**35 Gm.**
Distilled Water, *sixty milliliters*	**60 mils**
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the ferric pyrophosphate in the distilled water, with the aid of heat, add sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR FERRI PYROPHOSPHATIS, QUININÆ ET STRYCHNINÆ

Elixir of Ferric Pyrophosphate, Quinine and Strychnine

Elix. Ferr. Pyrophos. Quin. et Strych.

Ferric Pyrophosphate, *thirty-five grammes*	35.00 Gm.
Quinine Sulphate, *eight and seventy-five hundredths grammes*	8.75 Gm.
Strychnine, *fourteen hundredths of a gramme*	0.14 Gm.
Citric Acid, *seven-tenths of a gramme*	0.70 Gm.
Oil of Orange, *seven-tenths of a milliliter*	0.70 mil
Alcohol, *two hundred and fifty milliliters*	250.00 mils
Syrup, *three hundred and seventy-five milliliters*	375.00 mils
Ammonia Water,	
Distilled Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Triturate the quinine sulphate, strychnine and citric acid together, until minutely divided, then add the alcohol and oil of orange. Warm the syrup to about 65° C. and add it to the turbid alcoholic mixture, and stir until it becomes clear. To this add the ferric pyrophosphate, previously dissolved in *three hundred and twenty milliliters* of distilled water, and then ammonia water, drop by drop, until the liquid is neutral to litmus paper. Finally add sufficient distilled water to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR FERRI, QUININÆ ET STRYCHNINÆ

Elixir of Iron, Quinine and Strychnine

Elix. Ferr. Quin. et Strych.

Tincture of Ferric Citro-Chloride, *one hundred and twenty-five milliliters*	125.000 mils
Quinine Hydrochloride, *eight and seventy-five hundredths grammes*	8.750 Gm.
Strychnine Sulphate, *one hundred and seventy-five milligrammes*	0.175 Gm.
Compound Spirit of Orange, *ten milliliters*	10.000 mils
Alcohol, *two hundred and forty milliliters*	240.000 mils
Glycerin, *three hundred milliliters*	300.000 mils
Purified Talc, *twenty grammes*	20.000 Gm.
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the quinine hydrochloride in the alcohol, add the compound spirit of orange, then the strychnine sulphate dissolved in *ten milliliters* of distilled water, the glycerin, the tincture of ferric citro-chloride and then sufficient distilled water to make the product measure *one thousand milliliters*. Finally add the purified talc and filter, returning the first portions of the filtrate until it passes through clear. Preserve the product in dark amber-colored bottles.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR FORMATUM

Elixir of Formates

Elix. Format.

Potassium Carbonate, *forty-one grammes*	41 Gm.
Monohydrated Sodium Carbonate, *thirty-six grammes*	36 Gm.
Formic Acid, *two hundred and twenty-five milliliters*	225 mils
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the potassium and sodium carbonates in the formic acid, add sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR FORMATUM COMPOSITUM

Compound Elixir of Formates

Elix. Format. Co.

Monohydrated Sodium Carbonate, *twenty-three grammes*	23.0 Gm.
Magnesium Carbonate, *twenty grammes*	20.0 Gm.
Strontium Carbonate, *twenty-five grammes*	25.0 Gm.
Lithium Carbonate, *eight grammes*	8.0 Gm.
Quinine, *seven and seven-tenths grammes*	7.7 Gm.
Formic Acid, *two hundred milliliters*	200.0 mils
Compound Spirit of Cardamom, *five milliliters*	5.0 mils
Acetic Ether, *two milliliters*	2.0 mils
Alcohol, *one hundred milliliters*	100.0 mils
Glycerin, *three hundred milliliters*	300.0 mils
Purified Talc, *twenty grammes*	20.0 Gm.
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Add the formic acid to *three hundred milliliters* of distilled water and in this dissolve the carbonates and afterwards the quinine. To this solution add the glycerin and alcohol, previously mixed with the compound spirit of cardamom and the acetic ether. Agitate the mixture thoroughly and add sufficient distilled water to make the product measure *one thousand milliliters.* Then add the purified talc and filter, returning the first portions of the filtrate until it passes through clear.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR GENTIANÆ

Elixir of Gentian

Elix. Gent.

Fluidextract of Gentian, *thirty-five milliliters*	**35 mils**
Compound Spirit of Cardamom, *fifteen milliliters*	**15 mils**
Sodium Citrate, *thirty grammes*	**30 Gm.**
Glycerin, *fifty milliliters*	**50 mils**
Syrup, *two hundred and fifty milliliters*	**250 mils**
Alcohol, *two hundred milliliters*	**200 mils**
Purified Talc, *twenty grammes*	**20 Gm.**
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the sodium citrate in *three hundred and fifty milliliters* of distilled water, add this solution to the alcohol with which the compound spirit of cardamom has been mixed, then add the fluidextract of gentian, the syrup, the glycerin, and sufficient distilled water to make the product measure *one thousand milliliters.* Incorporate the purified talc and filter, returning the first portions of the filtrate until it passes through clear.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR GENTIANÆ ET FERRI

Elixir of Gentian and Iron

Elix. Gent. et Ferr.

Elixir Gentianæ cum Tinctura Ferri Chloridi, N.F. III Elixir of Gentian with Tincture of Ferric Citro-Chloride

Tincture of Ferric Citro-Chloride, *one hundred milliliters*	**100 mils**
Elixir of Gentian, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR GENTIANÆ ET FERRI PHOSPHATIS

Elixir of Gentian and Ferric Phosphate

Elix. Gent. et Ferr. Phosph. Elixir Gentianæ Ferratum

Ferric Phosphate, *seventeen and five-tenths grammes*	17.5 Gm.
Distilled Water, *thirty-five milliliters*	35.0 mils
Elixir of Gentian, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the ferric phosphate in the distilled water with the aid of heat, and add sufficient elixir of gentian to make the product measure *one thousand milliliters* and filter.

Average dose—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR GENTIANÆ GLYCERINATUM

Glycerinated Elixir of Gentian

Elix. Gent. Glycerin.

Fluidextract of Gentian, *ten milliliters*	10.0 mils
Fluidextract of Taraxacum, *fifteen milliliters*	15.0 mils
Acetic Ether, *five-tenths of a milliliter*	0.5 mil
Phosphoric Acid, *five milliliters*	5.0 mils
Tincture of Sweet Orange Peel, *fifteen milliliters*	15.0 mils
Compound Tincture of Cardamom, *sixty milliliters*	60.0 mils
Glycerin, *four hundred milliliters*	400.0 mils
Sugar, *two hundred grammes*	200.0 Gm.
Sherry Wine, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the sugar in *three hundred and twenty-five milliliters* of sherry wine, add the other ingredients, previously mixed, and sufficient sherry wine to make the product measure *one thousand milliliters.* Allow the preparation to stand twenty-four hours and filter.

Average dose—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR GLYCEROPHOSPHATUM COMPOSITUM

Compound Elixir of Glycerophosphates

Elix. Glycerophos. Co. Compound Solution of Glycerophosphates

Solution of Sodium Glycerophosphate, *forty grammes*	40.00 Gm.
Calcium Glycerophosphate, *sixteen grammes*	16.00 Gm.
Ferric Glycerophosphate, *three grammes*	3.00 Gm.
Soluble Manganese Glycerophosphate, *two grammes*	2.00 Gm.
Quinine Glycerophosphate, *one gramme*	1.00 Gm.
Strychnine Glycerophosphate, *fifteen-hundredths of a gramme*	0.15 Gm.
Lactic Acid, *ten milliliters*	10.00 mils
Compound Spirit of Cardamom, *two milliliters*	2.00 mils
Alcohol, *one hundred and twenty-five milliliters*	125.00 mils
Glycerin, *three hundred and fifty milliliters*	350.00 mils
Purified Talc, *twenty grammes*	20.00 Gm.
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Triturate the calcium glycerophosphate to a smooth paste with *one hundred milliliters* of glycerin; dissolve the ferric and manganese salts, with the aid of a gentle heat, in *thirty milliliters* of distilled water, containing *four milliliters* of the lactic acid. Now dissolve the strychnine and the quinine glycerophosphates in *one hundred milliliters* of distilled water, containing the remainder of the lactic acid, then dissolve the sodium glycerophosphate in *thirty milliliters* of hot distilled water and add all solutions to the calcium glycerophosphate mixture. Mix thoroughly and add the remainder of the glycerin, the alcohol, the compound spirit of cardamom and sufficient distilled water to make the product measure *one thousand milliliters.* Add the purified talc, shake well and filter, returning the first portions of the filtrate until it passes through clear.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR GLYCYRRHIZÆ AQUOSUM

Aqueous Elixir of Glycyrrhiza

Elix. Glycyrrh. Aq. Aqueous Elixir of Licorice

Fluidextract of Glycyrrhiza, *one hundred and fifty milliliters*	150 mils
Compound Spirit of Cardamom, *five milliliters*	5 mils
Stronger Orange Flower Water, *two hundred milliliters*	200 mils

Glycerin, *one hundred and fifty milliliters*	150 mils
Syrup, *one hundred and fifty milliliters*	150 mils
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR GLYCYRRHIZÆ AROMATICUM

Aromatic Elixir of Glycyrrhiza

Elix. Glycyrrh. Arom. Aromatic Elixir of Licorice

Fluidextract of Glycyrrhiza, *one hundred and twenty-five milliliters*	125.00 mils
Oil of Clove, *seventy-five hundredths of a milliliter*	0.75 mil
Oil of Cinnamon, *seventy-five hundredths of a milliliter*	0.75 mil
Oil of Myristica, *five-tenths of a milliliter*	0.50 mil
Oil of Fennel, *one and five-tenths milliliters*	1.50 mils
Purified Talc, *twenty grammes*	20.00 Gm.
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Triturate the oils with the purified talc, gradually add the fluidextract and sufficient aromatic elixir to make the product measure *one thousand milliliters.* Allow the mixture to stand over night and filter, returning the first portions of the filtrate until it passes through clear.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR GUARANÆ

Elixir of Guarana

Elix. Guar.

Fluidextract of Guarana, *two hundred milliliters*	200 mils
Aromatic Elixir, *two hundred milliliters*	200 mils
Compound Elixir of Taraxacum, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix them; allow the mixture to stand over night and then filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR HUMULI

Elixir of Hops

Elix. Humul.

Fluidextract of Hops, *one hundred and twenty-five milliliters* .	125 mils
Tincture of Vanilla, *thirty milliliters*	30 mils
Compound Elixir of Taraxacum, *one hundred and twenty-five milliliters*	125 mils
Purified Talc, *twenty grammes*	20 Gm.
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Triturate the fluidextract of hops with the purified talc, then gradually add the compound elixir of taraxacum, the tincture of vanilla and sufficient aromatic elixir to make the product measure *one thousand milliliters*. Allow the mixture to stand over night and then filter, returning the first portions of the filtrate until it passes through clear.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR HYPOPHOSPHITUM

Elixir of Hypophosphites

Elix. Hypophos.

Calcium Hypophosphite, *fifty-two and five-tenths grammes* . .	52.5 Gm.
Sodium Hypophosphite, *seventeen and five-tenths grammes* . .	17.5 Gm.
Potassium Hypophosphite, *seventeen and five-tenths grammes* .	17.5 Gm.
Hypophosphorous Acid, *four milliliters*	4.0 mils
Distilled Water, *four hundred and twenty milliliters*	420.0 mils
Glycerin, *thirty milliliters*	30.0 mils
Compound Spirit of Cardamom, *six-tenths of a milliliter* . .	0.6 mil
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the hypophosphites in the distilled water to which the acid has been added; then add the glycerin, the compound spirit of cardamom and sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR HYPOPHOSPHITUM ET FERRI

Elixir of Hypophosphites and Iron

Elix. Hypophos. et Ferr. Elixir Hypophosphitum cum Ferro, N.F. III

Calcium Hypophosphite, *seventeen and five-tenths grammes*	17.50 Gm.
Sodium Hypophosphite, *seventeen and five-tenths grammes*	17.50 Gm.
Potassium Hypophosphite, *eight and seventy-five hundredths grammes*	8.75 Gm.
Ferric Hypophosphite, *eight and seventy-five hundredths grammes*	8.75 Gm.
Potassium Citrate, *eleven grammes*	11.00 Gm.
Hypophosphorous Acid, *four milliliters*	4.00 mils
Distilled Water, *two hundred and fifty milliliters*	250.00 mils
Syrup, *two hundred and fifty milliliters*	250.00 mils
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the ferric hypophosphite and the potassium citrate in *fifty milliliters* of warm distilled water and add the syrup. Dissolve the other hypophosphites in the remainder of the distilled water and mix the two solutions. Finally add the acid and sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter. Store the product in dark amber-colored bottles.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR LITHII BROMIDI

Elixir of Lithium Bromide

Elix. Lith. Brom.

Lithium Bromide, *eighty-five grammes*	85 Gm.
Syrup, *two hundred milliliters*	200 mils
Distilled Water, *four hundred and sixty milliliters*	460 mils
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the lithium bromide in the distilled water, add the syrup and sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR LITHII CITRATIS

Elixir of Lithium Citrate

Elix. Lith. Cit.

Lithium Citrate, *eighty-five grammes*	**85 Gm.**
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the lithium citrate in sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR LITHII SALICYLATIS

Elixir of Lithium Salicylate

Elix. Lith. Sal.

Lithium Salicylate, *eighty-five grammes*	**85 Gm.**
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the lithium salicylate in sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR PEPSINI

Elixir of Pepsin

Elix. Pepsin.

Glycerite of Pepsin, *two hundred milliliters*	**200 mils**
Glycerin, *one hundred milliliters*	**100 mils**
Hydrochloric Acid, *four milliliters*	**4 mils**
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix the glycerite of pepsin, glycerin and hydrochloric acid, add sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR PEPSINI, BISMUTHI ET STRYCHNINÆ

Elixir of Pepsin, Bismuth and Strychnine

Elix. Pepsin. Bism. et Strych.

Strychnine, *one hundred and seventy-five milligrammes*	0.175 Gm.
Tartaric Acid, *one hundred and seventy-five milligrammes* . . .	0.175 Gm.
Elixir of Pepsin and Bismuth, *a sufficient quantity,*	
To make *one thousand milliliters* . . .	1000 mils

Triturate the strychnine and tartaric acid with *thirty milliliters* of the elixir, until dissolved, then add the remainder of the elixir, mix well, and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR PEPSINI ET BISMUTHI

Elixir of Pepsin and Bismuth

Elix. Pepsin. et Bism.

Pepsin, *eight and five-tenths grammes*	8.5 Gm.
Glycerin, *one hundred and twenty-five milliliters*	125.0 mils
Glycerite of Bismuth, *one hundred and twenty-five milliliters* .	125.0 mils
Distilled Water, *two hundred and fifty milliliters*	250.0 mils
Tincture of Caramel, *five milliliters*	5.0 mils
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the pepsin in the glycerin and distilled water; add the glycerite of bismuth and *four hundred and ninety milliliters* of aromatic elixir and, if decidedly acid, nearly neutralize the mixture with solution of sodium hydroxide. Finally add the tincture of caramel and sufficient aromatic elixir to make the product measure *one thousand milliliters,* mix well and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR PEPSINI ET FERRI

Elixir of Pepsin and Iron

Elix. Pepsin. et Ferr.

Tincture of Ferric Citro-Chloride, *seventy-five milliliters* . .	75 mils
Elixir of Pepsin, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix them and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR PEPSINI ET RENNINI COMPOSITUM

Compound Elixir of Pepsin and Rennin

Elix. Pepsin. et Rennin. Co. Essentia Pepsini, N.F. III

Pepsin, *twenty-two and five-tenths grammes*	22.5 Gm.
Rennin, *sixteen and five-tenths grammes*	16.5 Gm.
Lactic Acid, *two milliliters*	2.0 mils
Tincture of Sweet Orange Peel, *fifteen milliliters*	15.0 mils
Glycerin, *one hundred and fifty milliliters*	150.0 mils
Alcohol, *two hundred milliliters*	200.0 mils
Oil of Myristica, *one-tenth of a milliliter*	0.1 mil
Purified Talc, *twenty grammes*	20.0 Gm.
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the pepsin and rennin with *three hundred milliliters* of distilled water, add the lactic acid and glycerin, allow the mixture to stand with occasional gentle agitation until solution is effected and then add the tincture of sweet orange peel, the oil of myristica and the alcohol, previously mixed. The latter should be added in portions, shaking the mixture gently after each addition, and finally add sufficient distilled water to make the product measure *one thousand milliliters.* Add the purified talc, allow the mixture to stand, with occasional gentle agitation during twenty-four hours, and filter, returning the first portions of the filtrate until it passes through clear.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR PHOSPHORI

Elixir of Phosphorus

Elix. Phosphor.

Phosphorus, *twenty-five hundredths of a gramme*	0.25 Gm.
Chloroform, *five milliliters*	5.00 mils
Alcohol, *three hundred and forty milliliters*	340.00 mils
Glycerin, *three hundred milliliters*	300.00 mils
Compound Spirit of Orange, *ten milliliters*	10.00 mils
Oil of Anise, *two milliliters*	2.00 mils
Purified Talc, *thirty grammes*	30.00 Gm.
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Weigh the phosphorus in a tared watch-crystal containing water, then dry it carefully and quickly with blotting paper and introduce it into a strong flask or bottle of *one hundred milliliters* capacity containing the chloroform. Stopper the container, warm it on a water bath until the phosphorus melts into a globule and agitate it thoroughly, repeating the operation, if necessary, until the phosphorus is all dissolved. Add the chloroform solution to the alcohol, which has been warmed to from 55° to 60° C. in a bottle graduated to *one thousand milliliters*, shake it thoroughly, add the oil of anise, the compound spirit of orange and the glycerin in divided portions, shaking the mixture after each addition, and then sufficient distilled water to make the product measure *one thousand milliliters*. Finally add the purified talc and filter, returning the first portions of the filtrate until it passes through clear.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR PHOSPHORI ET NUCIS VOMICÆ

Elixir of Phosphorus and Nux Vomica

Elix. Phosphor. et Nuc. Vom.

Tincture of Nux Vomica, *three and five-tenths milliliters* . . .	3.5 mils
Elixir of Phosphorus, *a sufficient quantity,*	
To make *one hundred milliliters*	100 mils

Mix them.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR POTASSII ACETATIS

Elixir of Potassium Acetate

Elix. Pot. Acet.

Potassium Acetate, *eighty-five grammes*	85 Gm.
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the potassium acetate in sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 15 mils—Apothecaries, 4 fluidrachms.

ELIXIR POTASSII ACETATIS ET JUNIPERI

Elixir of Potassium Acetate and Juniper

Elix. Pot. Acet. et Junip.

Potassium Acetate, *eighty-five grammes*	85 Gm.
Fluidextract of Juniper, *one hundred and twenty-five milliliters*	125 mils
Purified Talc, *twenty grammes*	20 Gm.
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the fluidextract of juniper with *seven hundred and fifty milliliters* of aromatic elixir, in which the potassium acetate has been dissolved, and then add sufficient aromatic elixir to make the product measure *one thousand milliliters.* Add the purified talc, allow the mixture to stand for twelve hours with occasional agitation, and filter, returning the first portions of the filtrate until it passes through clear.

AVERAGE DOSE—Metric, 15 mils—Apothecaries, 4 fluidrachms.

ELIXIR POTASSII BROMIDI

Elixir of Potassium Bromide

Elix. Pot. Brom.

Potassium Bromide, *one hundred and seventy-five grammes* . .	175 Gm.
Syrup, *two hundred milliliters*	200 mils
Distilled Water, *four hundred and sixty milliliters*	460 mils
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the potassium bromide in the distilled water, add the syrup and sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

NOTE.—If a colored Elixir is preferred add *fifteen milliliters* of Compound Tincture of Cudbear in place of the same quantity of aromatic elixir.

ELIXIR QUININÆ VALERATIS ET STRYCHNINÆ

Elixir of Quinine Valerate and Strychnine

Elix. Quin. Valer. et Strych. Elixir Quininæ Valerianatis et Strychninæ, N.F. III

Quinine Valerate, *seventeen and five-tenths grammes*	17.500 Gm.
Strychnine Sulphate, *one hundred and seventy-five milligrammes*	0.175 Gm.
Compound Tincture of Cudbear, *fifteen milliliters*	15.000 mils
Distilled Water, *five milliliters*	5.000 mils
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the strychnine sulphate in the distilled water, mix this solution with *eight hundred milliliters* of aromatic elixir, and dissolve the quinine valerate in this mixture. Then add the compound tincture of cudbear, and sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR RUBI COMPOSITUM

Compound Elixir of Blackberry

Elix. Rubi Co.

Rubus, in No. 40 powder, *sixteen grammes*	16 Gm.
Nutgall, in No. 40 powder, *sixteen grammes*	16 Gm.
Saigon Cinnamon, in No. 40 powder, *sixteen grammes*	16 Gm.
Clove, in No. 40 powder, *four grammes*	4 Gm.
Mace, in No. 40 powder, *two grammes*	2 Gm.
Jamaica Ginger, in No. 40 powder, *two grammes*	2 Gm.
Syrup of Blackberry Fruit, *seven hundred and fifty milliliters*	750 mils
Diluted Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Moisten the mixed drugs with diluted alcohol, pack them firmly in a cylindrical percolator and percolate with the same menstruum, in the usual manner, until the percolate measures *two hundred and fifty milliliters.* To the percolate add the syrup of blackberry fruit, and mix thoroughly; allow it to stand for several days, and filter.

AVERAGE DOSE—Metric, 15 mils—Apothecaries, 4 fluidrachms.

ELIXIR SODII BROMIDI

Elixir of Sodium Bromide

Elix. Sod. Brom.

Sodium Bromide, *one hundred and seventy-five grammes*	175 Gm.
Syrup, *two hundred milliliters*	200 mils
Distilled Water, *four hundred and sixty milliliters*	460 mils
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the sodium bromide in the distilled water, add the syrup and sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR SODII HYPOPHOSPHITIS

Elixir of Sodium Hypophosphite

Elix. Sod. Hypophos.

Sodium Hypophosphite, *thirty-five grammes*	35 Gm.
Hypophosphorous Acid, *four milliliters*	4 mils
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the sodium hypophosphite in *eight hundred and twenty-five milliliters* of aromatic elixir. Then add the acid and sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR SODII SALICYLATIS

Elixir of Sodium Salicylate

Elix. Sod. Sal.

Sodium Salicylate, *eighty-five grammes*	85 Gm.
Syrup, *two hundred milliliters*	200 mils
Distilled Water, *four hundred and sixty milliliters*	460 mils
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the sodium salicylate in the distilled water, add the syrup and sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR SODII SALICYLATIS COMPOSITUM

Compound Elixir of Sodium Salicylate

Elix. Sod. Sal. Co.

Sodium Salicylate, *eighty grammes*	80 Gm.
Fluidextract of Cimicifuga, *thirty-two milliliters*	32 mils
Fluidextract of Gelsemium, *sixteen milliliters*	16 mils
Potassium Iodide, *fifteen grammes*	15 Gm.
Purified Talc, *twenty grammes*	20 Gm.
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the sodium salicylate and potassium iodide in *eight hundred milliliters* of aromatic elixir, add the fluidextracts and then sufficient aromatic elixir to make the product measure *one thousand milliliters.* Then incorporate the purified talc, mix and filter, returning the first portions of the filtrate until it passes through clear. Store the product in dark amber-colored bottles.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR STRYCHNINÆ VALERATIS

Elixir of Strychnine Valerate

Elix. Strych. Valer. Elixir Strychninæ Valerianatis, N.F. III

Strychnine Valerate, *one hundred and seventy-five milligrammes*	0.175 Gm.
Distilled Water, *five milliliters*	5.000 mils
Tincture of Vanilla, *fifteen milliliters*	15.000 mils
Compound Tincture of Cudbear, *fifteen milliliters*	15.000 mils
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the strychnine valerate in the distilled water, with the aid of heat, mix this solution thoroughly with *nine hundred milliliters* of

aromatic elixir, add the tinctures, and finally sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR TARAXACI COMPOSITUM

Compound Elixir of Taraxacum

Elix. Tarax. Co.

Fluidextract of Taraxacum, *thirty-five milliliters*	35 mils
Fluidextract of Wild Cherry, *twenty milliliters*	20 mils
Fluidextract of Glycyrrhiza, *sixty milliliters*	60 mils
Tincture of Sweet Orange Peel, *sixty milliliters*	60 mils
Tincture of Cinnamon, *thirty milliliters*	30 mils
Compound Tincture of Cardamom, *thirty milliliters*	30 mils
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the fluidextracts, add the tinctures, and then sufficient aromatic elixir to make the product measure *one thousand milliliters.* Allow it to stand during twelve hours and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

ELIXIR TERPINI HYDRATIS

Elixir of Terpin Hydrate

Elix. Terpin. Hyd.

Terpin Hydrate, in fine powder, *seventeen and five-tenths grammes*	17.5 Gm.
Tincture of Sweet Orange Peel, *twenty milliliters*	20.0 mils
Spirit of Bitter Almond, *five milliliters*	5.0 mils
Alcohol, *four hundred and twenty-five milliliters*	425.0 mils
Glycerin, *four hundred milliliters*	400.0 mils
Syrup, *one hundred milliliters*	100.0 mils
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the terpin hydrate in the alcohol, add successively the tincture, spirit, glycerin, syrup and sufficient distilled water to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR TERPINI HYDRATIS ET CODEINÆ

Elixir of Terpin Hydrate and Codeine

Elix. Terpin. Hyd. et Codein. Elixir Terpini Hydratis cum Codeina, N.F. III

Codeine, *two grammes*	2 Gm.
Elixir of Terpin Hydrate, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the codeine in sufficient of the elixir to measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR TERPINI HYDRATIS ET DIACETYLMORPHINÆ

Elixir of Terpin Hydrate and Diacetylmorphine

Elix. Terpin. Hyd. et Diacetylmorph. Elixir Terpini Hydratis cum Heroina, N.F. III

Diacetylmorphine Hydrochloride, *twenty-seven hundredths of a gramme*	0.27 Gm.
Elixir of Terpin Hydrate, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the diacetylmorphine hydrochloride in sufficient of the elixir to measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR TRIUM BROMIDORUM

Elixir of Three Bromides

Elix. Tri. Brom.

Ammonium Bromide, *eighty grammes*	80 Gm.
Potassium Bromide, *eighty grammes*	80 Gm.
Sodium Bromide, *eighty grammes*	80 Gm.
Cudbear, *two grammes*	2 Gm.
Compound Elixir of Almond, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the bromides in *eight hundred milliliters* of compound elixir of almond, add the cudbear and allow the mixture to macerate in a stop-

pered bottle for six hours, with occasional shaking; then add sufficient compound elixir of almond to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR VANILLINI COMPOSITUM

Compound Elixir of Vanillin

Elix. Vanil. Co.

Compound Spirit of Vanillin, *twenty milliliters*	**20 mils**
Alcohol, *eighty milliliters*	**80 mils**
Glycerin, *twenty-five milliliters*	**25 mils**
Syrup, *three hundred milliliters*	**300 mils**
Purified Talc, *twenty grammes*	**20 Gm.**
Tincture of Caramel, *twenty milliliters*	**20 mils**
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix the compound spirit of vanillin with the alcohol, add the glycerin, and then the syrup and *five hundred and fifty-five milliliters* of distilled water, in several portions, shaking the mixture thoroughly after each addition. Then add the tincture of caramel and sufficient distilled water to make the product measure *one thousand milliliters.* Add the purified talc and filter, returning the first portions of the filtrate until it passes through clear.

ELIXIR VIBURNI OPULI COMPOSITUM

Compound Elixir of Viburnum Opulus

Elix. Viburn. Opul. Co.

Fluidextract of Viburnum Opulus, *seventy-five milliliters* . .	**75 mils**
Fluidextract of Trillium, *one hundred and fifty milliliters* . .	**150 mils**
Fluidextract of Aletris, *seventy-five milliliters*	**75 mils**
Compound Elixir of Taraxacum, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix the fluidextracts with the elixir; allow the mixture to stand during twelve hours and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR VIBURNI PRUNIFOLII

Elixir of Viburnum Prunifolium

Elix. Viburn. Prun. Elixir of Black Haw

Fluidextract of Viburnum Prunifolium, *one hundred and twenty-five milliliters*	125 mils
Compound Tincture of Cardamom, *seventy-five milliliters*	75 mils
Aromatic Elixir, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix them, allow the product to stand during twelve hours and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

ELIXIR ZINCI VALERATIS

Elixir of Zinc Valerate

Elix. Zinc. Valer. Elixir Zinci Valerianatis, N.F. III

Zinc Valerate, *seventeen and five-tenths grammes*	17.5 Gm.
Citric Acid, *fifty-six grammes*	56.0 Gm.
Alcohol, *one hundred and twenty-five milliliters*	125.0 mils
Spirit of Bitter Almond, *ten milliliters*	10.0 mils
Compound Tincture of Cudbear, *fifteen milliliters*	15.0 mils
Stronger Ammonia Water,	
Distilled Water,	
Aromatic Elixir, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Neutralize the citric acid with the stronger ammonia water and add sufficient distilled water to make *one hundred milliliters* of solution. Add *two hundred and fifty milliliters* of aromatic elixir and the alcohol, and dissolve the zinc valerate in this mixture. Then add the spirit of bitter almond, the compound tincture of cudbear, and finally sufficient aromatic elixir to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

EMPLASTRUM FUSCUM CAMPHORATUM

Camphorated Brown Plaster

Emp. Fusc. Camph. Camphorated Mother Plaster

Red Oxide of Lead, *thirty grammes*	30 Gm.
Olive Oil, *sixty grammes*	60 Gm.
Yellow Wax, *fifteen grammes*	15 Gm.
Camphor, *one gramme*	1 Gm.

Triturate the red oxide of lead with *fifty-five grammes* of the oil in a suitable kettle until a smooth paste results, and boil the mixture over a fire, with constant stirring, until gas bubbles rise, or until the red color of the mixture begins to turn brown. Then moderate the heat, but continue the stirring until the mixture has acquired a dark-brown color. From time to time allow a few drops of it to fall into cold water to test its consistence, and when these congeal to a firm consistence remove the vessel from the fire, add the wax, cut into small pieces, and finally the camphor, previously rubbed to a smooth paste with the rest of the olive oil. Mix thoroughly, allow the mixture to cool somewhat, and while still warm pour it into paper-moulds, previously coated with mucilage of acacia containing about five per cent. of glycerin, and allowed to dry.

EMPLASTRUM SAPONIS

Soap Plaster

(U.S.P. VIII)

Emp. Sapon.

Soap, dried, and in coarse powder, *ten grammes*	**10 Gm.**
Lead Plaster, *ninety grammes*	**90 Gm.**
Water, *a sufficient quantity,*	
To make about *one hundred grammes* . . .	**100 Gm.**

Rub the soap with enough water to reduce it to a semi-liquid, mix it with the lead plaster, previously melted, incorporate thoroughly by stirring, and evaporate the mixture to the consistence of a plaster.

EMULSA

Emulsions

The successful formation of emulsions, whether of fixed or volatile oils, is most satisfactorily and expeditiously accomplished with acacia as the emulsifying agent. Preference is therefore given to acacia in this Formulary, though other emulsifying agents are not ignored, and their use and application is exemplified in a number of alternative formulas for preparing Emulsions of Cod Liver Oil.

Emulsification.—When acacia is used as the emulsifying agent, it is essential that the oil, the acacia and the water shall primarily be in definite proportions to each other. This proportion is four (4) parts of oil, one (1) part of acacia, and two (2) parts of water. (Liquids by measure, solids by weight.) The oil (4) and acacia (1) in fine powder are well

mixed by trituration in a perfectly dry mortar; the water (2) is then added in one portion, and the whole is triturated briskly until a thick, creamy emulsion is produced; the sides of the mortar should be carefully scraped, and the mixture again thoroughly triturated so as to insure complete emulsification of the oil. During warm weather, the cooling of the oil and water will greatly facilitate emulsification. The other ingredients may then be gradually added; first the flavoring, then the greater part of the water necessary to make the final quantity, then the syrup, etc. Finally, the quantity is adjusted by the addition of sufficient water.

Alcoholic liquids are added last, and must be mixed previously with a portion of the water.

With some other emulsifying agents, such as mucilage of chondrus and glycerite of yolk of egg, it will suffice to place the agent in a bottle or mortar, and to add the oil in small portions at a time, shaking or triturating briskly after each addition until emulsification is complete.

The preparation of emulsions is much facilitated by the use of mechanical contrivances that are capable of producing brisk agitation and a mingling of the several fluids, and can be employed when emulsions are to be made in large quantities.

Emulsions under ordinary conditions are prone to deteriorate on standing, and it is recommended that they be recently prepared when wanted.

Flavoring.—Since no single or compound aromatic can be suggested which would be acceptable under all circumstances as a flavoring for Emulsions of Cod Liver Oil, the selection of the most suitable aromatic must be left to the prescriber or dispenser. Among those which are found to be most serviceable are the following, the quantities given being intended for *one thousand milliliters* of finished product;

a.	Oil of Betula	4 mils
b.	Oil of Betula	2 mils
	Oil of Sassafras	2 mils
c.	Compound Spirit of Orange	1.5 mils
d.	Oil of Betula	2.00 mils
	Oil of Bitter Almond	0.25 mil
	Oil of Coriander	0.25 mil
e.	Oil of Betula	1.50 mils
	Oil of Sassafras	1.50 mils
	Oil of Bitter Almond	0.25 mil
f.	Oil of Betula	2.5 mils
	Oil of Bitter Almond	2.5 mils

EMULSUM OLEI MORRHUÆ CUM CALCII LACTOPHOSPHATE

Emulsion of Cod Liver Oil with Calcium Lactophosphate

Emul. Ol. Morrh. c. Calc. Lactophos.

Cod Liver Oil, *five hundred milliliters*	500 mils
Calcium Lactophosphate, *fifty grammes*	50 Gm.
Lactic Acid, *sixteen milliliters*	16 mils
Acacia, in fine powder, *one hundred and twenty-five grammes*	125 Gm.
Syrup of Tolu, *one hundred milliliters*	100 mils
Flavoring (see under *Emulsa*),	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Triturate the acacia with the cod liver oil in a dry mortar, until uniformly mixed, then add at once *two hundred and fifty milliliters* of water and triturate the mixture rapidly until complete emulsification results. Dissolve the calcium lactophosphate in *sixty-five milliliters* of water with the aid of the lactic acid, and incorporate this solution with the emulsion just prepared, adding the flavoring, the syrup of tolu and sufficient water to make the product measure *one thousand milliliters.* Mix thoroughly.

AVERAGE DOSE—Metric, 15 mils—Apothecaries, 4 fluidrachms.

EMULSUM OLEI MORRHUÆ CUM CALCII PHOSPHATE

Emulsion of Cod Liver Oil with Calcium Phosphate

Emul. Ol. Morrh. c. Calc. Phos. Emulsion of Cod Liver Oil with Phosphate of Lime

Cod Liver Oil, *five hundred milliliters*	500 mils
Acacia, in fine powder, *one hundred and twenty-five grammes*	125 Gm.
Precipitated Calcium Phosphate, *thirty-five grammes*	35 Gm.
Syrup of Tolu, *one hundred milliliters*	100 mils
Flavoring (see under *Emulsa*),	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Triturate the acacia with the cod liver oil in a dry mortar, until uniformly mixed, then add at once *two hundred and fifty milliliters* of water

and triturate lightly and rapidly until the oil is completely emulsified. Then incorporate the flavoring, and the syrup of tolu and precipitated calcium phosphate, previously mixed, and lastly sufficient water to make the product measure *one thousand milliliters.* Mix thoroughly.

AVERAGE DOSE—Metric, 15 mils—Apothecaries, 4 fluidrachms.

EMULSUM OLEI MORRHUÆ CUM HYPOPHOSPHITIBUS

Emulsion of Cod Liver Oil with Hypophosphites

(U.S.P. VIII)

Emul. Ol. Morrh. c. Hypophos.

Cod Liver Oil, *five hundred milliliters*	500 mils
Acacia, in fine powder, *one hundred and twenty-five grammes*	125 Gm.
Calcium Hypophosphite, *ten grammes*	10 Gm.
Potassium Hypophosphite, *five grammes*	5 Gm.
Sodium Hypophosphite, *five grammes*	5 Gm.
Syrup, *one hundred milliliters*	100 mils
Flavoring (see under *Emulsa*),	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Triturate the acacia with the cod liver oil in a dry mortar until uniformly mixed, then add at once *two hundred and fifty milliliters* of water and triturate lightly and rapidly until the oil is completely emulsified, add the flavoring and incorporate thoroughly. Dissolve the hypophosphites in *one hundred milliliters* of water, mix the solution with the syrup, and add this liquid gradually to the emulsion with continued trituration. Finally add sufficient water to make the product measure *one thousand milliliters,* and mix thoroughly.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

EMULSUM OLEI MORRHUÆ CUM MALTO

Emulsion of Cod Liver Oil with Malt

Emul. Ol. Morrh. c. Malt.

Emulsum Olei Morrhuæ cum Extracto Malti, N.F. III

Cod Liver Oil, *three hundred milliliters*	300 mils
Tragacanth, in fine powder, *three grammes*	3 Gm.
Water, *one hundred and fifty milliliters*	150 mils
Extract of Malt, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the oil and tragacanth thoroughly in a bottle, add the water and shake the mixture until a homogeneous suspension is formed, finally add the extract of malt in portions, shaking the mixture thoroughly after each addition, until the finished product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 15 mils—Apothecaries, 4 fluidrachms.

EMULSUM OLEI MORRHUÆ CUM PRUNO VIRGINIANA

Emulsion of Cod Liver Oil with Wild Cherry

Emul. Ol. Morrh. c. Prun. Virg.

Cod Liver Oil, *five hundred milliliters*	**500 mils**
Acacia, in fine powder, *one hundred and twenty-five grammes*	**125 Gm.**
Fluidextract of Wild Cherry, *sixty-five milliliters*	**65 mils**
Syrup of Tolu, *one hundred milliliters*	**100 mils**
Flavoring (see under *Emulsa*),	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Triturate the acacia with the cod liver oil in a dry mortar, until uniformly mixed, then add at once *two hundred and fifty milliliters* of water and triturate lightly and rapidly until the oil is completely emulsified. Then gradually incorporate the fluidextract and syrup, previously mixed with a portion of the remaining water, and finally add sufficient water to make the product measure *one thousand milliliters.* Mix thoroughly.

AVERAGE DOSE—Metric, 15 mils—Apothecaries, 4 fluidrachms.

EMULSUM OLEI MORRHUÆ CUM VITELLO

Emulsion of Cod Liver Oil with Egg

Emul. Ol. Morrh. c. Vitel.

Cod Liver Oil, *five hundred milliliters*	**500 mils**
Glycerite of Yolk of Egg, *one hundred and seventy-five milliliters*	**175 mils**
Syrup of Tolu, *one hundred milliliters*	**100 mils**
Flavoring (see under *Emulsa*),	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Triturate the glycerite of yolk of egg in a mortar with the oil, added in small portions at a time, and thoroughly emulsify each portion before adding the next. Then, continuing the trituration, gradually add the syrup of tolu, and the flavoring. Finally add sufficient water to make the product measure *one thousand milliliters*. Mix thoroughly.

AVERAGE DOSE—Metric, 15 mils—Apothecaries, 4 fluidrachms.

EMULSUM OLEI RICINI

Emulsion of Castor Oil

Emul. Ol. Ricin.

Castor Oil, *thirty-five milliliters*	35.0 mils
Acacia, in fine powder, *nine grammes*	9.0 Gm.
Tincture of Vanilla, *two and five-tenths milliliters*	2.5 mils
Syrup, *twenty milliliters*	20.0 mils
Water, *a sufficient quantity,*	
To make *one hundred milliliters*	100 mils

Triturate the acacia with the castor oil in a dry mortar, until uniformly mixed, then add *eighteen milliliters* of water and triturate lightly and rapidly until the oil is completely emulsified. Gradually incorporate the syrup and tincture, and finally add sufficient water to make the product measure *one hundred milliliters*. Mix thoroughly.

AVERAGE DOSE—Metric, 45 mils—Apothecaries, 1½ fluidounces.

EMULSUM PETROLATI

Emulsion of Petrolatum

Emul. Petrolat. Emulsum Petrolei, N.F. III

Petrolatum, *two hundred and twenty-five grammes*	225 Gm.
Expressed Oil of Almond, *two hundred and twenty-five milliliters*	225 mils
Acacia, in fine powder, *one hundred and twenty-five grammes*	125 Gm.
Syrup, *one hundred milliliters*	100 mils
Tincture of Lemon Peel, *fifteen milliliters*	15 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Triturate the melted petrolatum with the expressed oil of almond in a warm, dry mortar, add the acacia and triturate until it is uniformly mixed. Then add *two hundred and fifty milliliters* of warm water and

triturate rapidly until the mixture is completely emulsified. Now add the syrup and the tincture, previously mixed, and sufficient water to make the product measure *one thousand milliliters*. Mix thoroughly.

AVERAGE DOSE—Metric, 15 mils—Apothecaries, 4 fluidrachms.

EXTRACTA

Extracts

Pilular Extracts are solid or semi-solid products prepared by exhausting the powdered drugs with appropriate solvents and carefully evaporating these solutions to the proper consistence. These extracts preserve, in a concentrated, relatively uniform and permanent condition, the useful constituents of the drug in a form suitable for medication.

The solvents or menstrua employed in the preparation of pilular extracts are water, alcohol, or mixtures of these in the proportions stated in the formulas. A few drugs require for their extraction the addition of an acid or an alkali to the solvent. Where alcohol is used in the extraction it should be recovered by distillation.

In the preparation of pilular extracts the concentration of the solutions should be started without delay, and undue exposure to heat must be avoided. The limit of temperature for the evaporation, as stated in the formulas, should not be exceeded. In the manufacture of these extracts on a large scale an apparatus for carrying on distillation and evaporation under reduced pressure should be used. It is also important that the residue be frequently stirred, so as to hasten the evaporation and to obtain a uniform product.

Pilular extracts are extensively used in pill masses and in ointments and, to facilitate their use in these preparations, the degree of concentration is commonly directed to be of a "pilular consistence." In some instances, the proper consistence is maintained by the addition of a specified amount of glycerin.

Pilular extracts should be protected from exposure to sunlight and air by being kept in tightly-covered glass or earthen-ware jars.

Powdered Extracts differ from pilular extracts in that they are dry, fine powders. Powdered extracts are often preferred to pilular extracts for general use, because they can be more accurately weighed, easily dispensed and can be preserved in tightly-stoppered bottles.

In the preparation of powdered extracts, it is necessary to use solvents that will extract the active principles of the drugs with only a minimum amount of the inert constituents. Where the drug contains an oily con-

stituent that would be extracted by the menstruum directed, it becomes necessary to adopt in the process of manufacture a method for the separation of this oil so that the product will retain a satisfactory, pulverulent form.

The concentration of the liquids containing the extractive should be started without delay, and undue exposure to heat must be avoided. The limit of temperature as stated in the formulas should not be exceeded, and the use of apparatus for carrying on the concentration under reduced pressure is recommended. The final drying of the soft extract can be greatly facilitated by spreading it upon plates of glass or tinned metal and exposing it to currents of warm air. Powdered extracts must be thoroughly dried, powdered and mixed with the diluent and preserved in tightly-stoppered, small, wide-mouthed, amber-colored bottles, and stored in a cool and dry place.

For Extracts that can be reliably assayed, alkaloidal standards have been adopted and assay methods are directed for the determination of their strength, and to provide for standardization. When necessary, an inert diluent is directed to reduce the product to the standard. In the official formulas glucose is directed for the diluent in pilular extracts and dried starch and magnesium oxide are directed for powdered extracts, but it is permissible for the manufacturer to use as inert diluents for the latter, sugar, sugar of milk, powdered glycyrrhiza, magnesium carbonate or the finely powdered drug or marc from which the respective extract was made. For the convenience of the prescriber, the standards of strength for the Extracts have been adjusted, wherever possible, so that each bears a definite relation to that of the respective drug of average strength and a statement of the standard precedes the formula.

EXTRACTUM ALOES

Extract of Aloes

(U.S.P. VIII)

Ext. Aloes Powdered Extract of Aloes

One gramme of the Extract represents *two grammes* of aloes.

Aloes, in No. 20 powder, *one thousand grammes*	**1000 Gm.**
Boiling Water, *ten thousand milliliters*	**10000 mils**
Starch, dried at 100° C., *a sufficient quantity,*	
To make *five hundred grammes*	**500 Gm.**

Mix the aloes with the boiling water in a suitable vessel, stir constantly until the particles of aloes are thoroughly disintegrated, and allow

the mixture to stand for twelve hours. Then pour off the clear liquid, strain the residue, and evaporate the mixed liquids to dryness on a water bath or steam bath. Reduce the extract to a fine powder, and, if necessary, add a sufficient quantity of the thoroughly dried starch to make the product weigh *five hundred grammes*. Mix the powders thoroughly, pass the powdered extract through a fine sieve, transfer it to small, wide-mouthed bottles and stopper them tightly.

AVERAGE DOSE—Metric, 0.125 Gm.—Apothecaries, 2 grains.

EXTRACTUM CINCHONÆ

Extract of Cinchona

Ext. Cinchon.

Extract of Cinchona yields not less than 22 per cent. nor more than 26 per cent. of the combined alkaloids of cinchona.

Cinchona, in No. 60 powder, *one thousand grammes* . . . . . **1000 Gm.**
Glucose,
Alcohol,
Water, each, *a sufficient quantity.*

Moisten the ground drug with *three hundred and fifty milliliters* of a menstruum made by mixing *three thousand milliliters* of alcohol and *one thousand milliliters* of water, introduce the moistened drug into a percolator and allow it to stand, well covered, for several hours. Then pack it firmly, pour on sufficient menstruum to saturate the powder, and leave a stratum above it, and when the liquid begins to drop from the percolator, close the lower orifice, and, having covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed slowly, first pouring on the remainder of the menstruum prepared above and following this with diluted alcohol until the percolate measures *four thousand milliliters*.

Reserve the first *nine hundred milliliters* of the percolate, evaporate the remainder, in a porcelain or enameled dish, at a temperature not exceeding 80° C., to *one hundred milliliters*, add the reserve portion, and again evaporate at or below the specified temperature until of pilular consistence.

Assay 3 Gm. of this extract, as directed below, and, from the result thus obtained, ascertain by calculation the amount of alkaloids in the remainder of the product and add enough glucose to make the finished Extract contain 24 per cent. of the combined alkaloids of cinchona.

Assay.—Dissolve 3 Gm. of Extract of Cinchona in 10 mils of a mixture of 3 parts of alcohol, and 2 parts of water, and having added 5 Gm. of purified sawdust (see Reagents, U. S. Pharmacopœia IX, Part II) evaporate the mixture to dryness. Then transfer it to a bottle of about 500 mils capacity, add 300 mils of a mixture of 2 volumes of ether and 1 volume of chloroform, rinse the dish with 10 mils of ammonia water, added in portions, and mix the rinsings with the ethereal solution. Shake the mixture at intervals during 12 hours, allow it to settle and decant 200 mils of the clear fluid, representing 2 Gm. of the extract. Then proceed as directed under *Fluidextractum Cinchonæ Aquosum* and multiply the weight of alkaloids obtained by 50 to obtain the per cent. present in the sample assayed.

AVERAGE DOSE—Metric, 0.25 Gm.—Apothecaries, 4 grains.

EXTRACTUM CONII

Extract of Conium

Ext. Conii.

Extract of Conium yields not less than 1.8 per cent. nor more than 2.2 per cent. of coniine.

Conium, in No. 40 powder, *one thousand grammes* . . . . . **1000 Gm.**
Diluted Hydrochloric Acid, *three milliliters* . . . . . **3 mils**
Glucose,
Diluted Alcohol, each, *a sufficient quantity.*

Moisten the powder with *three hundred milliliters* of diluted alcohol and pack it firmly in a cylindrical percolator; then add enough diluted alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed, gradually adding diluted alcohol, until the conium is exhausted. Reserve the first *nine hundred milliliters* of the percolate, add the diluted hydrochloric acid to the remainder, and evaporate it, at a temperature not exceeding 50° C., to *one hundred milliliters;* mix this with the reserved portion in a porcelain dish, and evaporate at or below 50° C. to a pilular consistence.

Assay 2 Gm. of this extract, as directed below, and, from the result thus obtained, ascertain by calculation the amount of coniine in the remainder of the product and add enough glucose to make the finished Extract contain 2 per cent. of coniine.

Assay.—Weigh accurately 2 Gm. of Extract of Conium and mix it intimately in a flask of about 50 mils capacity with 2 mils of diluted hydrochloric acid and 8 mils of distilled water. Shake this mixture thoroughly with 20 mils of purified petroleum benzin, allow the liquids to separate, and decant the benzin as closely as possible. Add a second portion of the benzin, shake well, and decant as before. Repeat the extraction with purified petroleum benzin until the washings are nearly colorless and are free from fat, and reject the benzin washings. Then add to the aqueous liquid an excess of potassium carbonate, to render it alkaline, and extract the alkaline solution by shaking it with successive portions of purified petroleum benzin until the alkaloid is all removed, as shown by shaking 5 mils of the last washing with 1 mil of

diluted hydrochloric acid and adding a drop of iodine T.S. to the acid solution, when no precipitate should form in the acid liquor. Filter the benzin solution into a wide-mouthed flask or beaker and wash the funnel and filter with a little of the benzin. Then add 10 mils of tenth-normal sulphuric acid V.S. and evaporate off the benzin at a gentle heat, with frequent stirring. Titrate the acid solution with fiftieth-normal potassium hydroxide V.S., using cochineal T.S. or methyl red T.S. as indicator, and calculate the amount of coniine present, using the factor 0.0127 for the tenth-normal sulphuric acid V.S. consumed by the alkaloid and multiplying the result by 50 to obtain the percentage of coniine in the extract.

AVERAGE DOSE—Metric, 0.03 Gm.—Apothecaries, ½ grain.

EXTRACTUM ERGOTÆ AQUOSUM

Aqueous Extract of Ergot

Ext. Ergot. Aq. Extractum Secalis Cornuti, P.I. Ergotin, P.I.

Ergot, in No. 30 powder, *two hundred grammes* . . . . . **200 Gm.**
Alcohol, *one hundred milliliters* . . . . . **100 mils**
Chloroform Water, *a sufficient quantity.*

Moisten the ergot with *four hundred milliliters* of chloroform water and allow it to stand in a closely-covered vessel for twenty-four hours, then transfer it to a cylindrical percolator, pack the drug lightly, and percolate with chloroform water, regulating the flow to not over 20 drops per minute, until the percolate measures *one thousand milliliters.* Evaporate the percolate in a tared dish on a water bath, at a moderate temperature, until reduced to *one hundred grammes* and, when cold, incorporate the alcohol and allow the mixture to stand in a tightly-covered or closed vessel during three days. Then filter the liquid, and evaporate the filtrate on a water bath, at a temperature not exceeding 50° C., to a pilular consistence.

AVERAGE DOSE—Metric, 0.2 Gm.—Apothecaries, 3 grains.

EXTRACTUM EUONYMI

Extract of Euonymus

(U.S.P. VIII)

Ext. Euonymi Powdered Extract of Euonymus

One gramme of the Extract represents *four grammes* of euonymus.

Euonymus, in No. 40 powder, *one thousand grammes* . . . . **1000 Gm.**
Alcohol,
Water,
Starch, dried at 100° C., each, *a sufficient quantity,*

To make *two hundred and fifty grammes* . . **250 Gm.**

Moisten the drug with sufficient of a mixture of *four volumes* of alcohol and *one volume* of water and pack it firmly in a cylindrical percolator;

then add enough of the menstruum, using the same proportion of alcohol and water as before, to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed slowly, adding the menstruum as required, until the drug is practically exhausted. Recover the alcohol from the percolate by distillation and evaporate the residue to dryness, with frequent stirring, at a temperature not exceeding 70° C. Reduce the extract to a fine powder, weigh it, and add sufficient of the dried starch to make the product weigh *two hundred and fifty grammes*. Mix it thoroughly, pass the Extract through a fine sieve, transfer it to small, wide-mouthed bottles and stopper them tightly.

AVERAGE DOSE—Metric, 0.125 Gm.—Apothecaries, 2 grains.

CAUTION—It has been stated that the absorption of Euonymus in the gastro-intestinal tract is uncertain and irregular. To avoid an accumulation of the drug or toxic action, the physician should carefully guard the dosage and determine in each case the tolerance of the patient.

EXTRACTUM FERRI POMATUM

Ferrated Extract of Apples

Ext. Ferr. Pomat. Ferri Malas Crudus Crude Malate of Iron

Reduced Iron, *forty grammes* . . . . . **40 Gm.**
Fresh Apple Juice, *one thousand grammes* . . . . . **1000 Gm.**
Water, *a sufficient quantity.*

Mix the fresh apple juice with the iron in an enameled or porcelain vessel, and apply the heat of a water bath, until no more gas is given off, adding a little water from time to time to make up any loss by evaporation. Dilute the liquid with water to make *one thousand grammes* and set it aside for a few days. Then filter, and evaporate the filtrate on a water bath in an enameled or porcelain vessel to the consistence of a pilular extract.

AVERAGE DOSE—Metric, 0.65 Gm.—Apothecaries, 10 grains.

EXTRACTUM HÆMATOXYLI

Extract of Hematoxylon

(U.S.P. VIII)

Ext. Hæmatox.

Hematoxylon, rasped, *one thousand grammes* . . . . . **1000 Gm.**
Water, *ten thousand milliliters* . . . . . **10000 mils**

Macerate the hematoxylon with the water for forty-eight hours. Then boil the mixture (avoiding the use of metallic vessels) until one-half of the water has evaporated; strain the decoction while hot and evaporate the strained liquid to dryness.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

EXTRACTUM IGNATIÆ

Extract of Ignatia

Ext. Ignat. Powdered Extract of Ignatia

Extract of Ignatia yields not less than 5.4 per cent. nor more than 6.6 per cent. of the combined alkaloids of ignatia.

Ignatia, in No. 40 powder, *one thousand grammes* . . . . . **1000 Gm.**
Alcohol,
Water,
Starch, dried at 100° C., each, *a sufficient quantity.*

Mix *three thousand milliliters* of alcohol with *one thousand milliliters* of water, and, having moistened the powder with *five hundred milliliters* of the mixture, pack it firmly in a conical percolator; then add enough menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed slowly, gradually adding the remainder of the menstruum and continuing the percolation with a mixture of alcohol and water in the same proportions as before, until the drug is practically exhausted. Recover the alcohol from the percolate, evaporate the residue to dryness at a temperature not exceeding 100° C., and weigh the product.

Assay 3 Gm. of this extract, as directed below, and, from the result thus obtained, ascertain by calculation the amount of alkaloids in the remainder of the product and add enough starch, previously dried at 100° C., to make the finished Extract contain 6 per cent. of the combined alkaloids of ignatia.

Assay.—Proceed as directed under *Ignatia*, using 3 Gm. of Extract of Ignatia.

AVERAGE DOSE—Metric, 0.03 Gm.—Apothecaries, ½ grain.

EXTRACTUM JALAPÆ

Extract of Jalap

Ext. Jalap.

Jalap, in No. 60 powder, *one thousand grammes* . . . . . **1000 Gm.**
Alcohol, *a sufficient quantity.*

Moisten the ground drug with *three hundred and fifty milliliters* of alcohol, place the moistened drug in a percolator, and allow it to stand, well covered, for several hours. Then pack it firmly, pour on alcohol to saturate the powder and leave a stratum above it, and when the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed slowly, gradually adding alcohol until the percolate measures *three thousand milliliters.*

Reserve the first *nine hundred milliliters* of the percolate, evaporate the remainder, in a porcelain or enameled dish, at a temperature not exceeding 50° C., to *one hundred milliliters,* add the reserved portion and evaporate at or below the above mentioned temperature until an extract of pilular consistence remains.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

EXTRACTUM KRAMERIÆ

Extract of Krameria

(U.S.P. VIII)

Ext. Kramer. Powdered Extract of Krameria

One gramme of the Extract represents *four grammes* of krameria.

Krameria, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**
Starch, dried at 100° C.,
Water, each, *a sufficient quantity,*

To make *two hundred and fifty grammes* . . **250 Gm.**

Moisten the drug thoroughly with water and pack it in a conical glass percolator, and gradually pour water upon it, until the infusion passes but slightly imbued with the taste of the drug. Heat the percolate to the boiling point, strain, and evaporate the strained liquid to dryness, by means of a water bath, at a temperature not exceeding 70° C. Reduce the extract to a fine powder, and add sufficient starch, previously dried

at 100° C., to make the product weigh *two hundred and fifty grammes.* Mix the powders thoroughly, pass the Extract through a fine sieve and transfer it to small, wide-mouthed bottles and stopper them tightly.

AVERAGE DOSE—Metric, 0.5 Gm.—Apothecaries, 8 grains.

EXTRACTUM LEPTANDRÆ

Extract of Leptandra

(U.S.P. VIII)

Ext. Leptand. Powdered Extract of Leptandra

One gramme of the Extract represents *four grammes* of leptandra.

Leptandra, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**
Starch, dried at 100° C.,
Alcohol,
Water, each, *a sufficient quantity,*

To make *two hundred and fifty grammes* . . **250 Gm.**

Moisten the powdered drug with sufficient of a mixture of *three volumes* of alcohol and *one volume* of water, and macerate it in a closed vessel for twenty-four hours. Then pack in a cylindrical percolator and gradually percolate with a menstruum of alcohol and water made in the same proportion as before, until the drug is practically exhausted. Recover the alcohol and evaporate the residue to dryness, on a water bath or steam bath at a temperature not exceeding 70° C. Reduce the extract to a fine powder and add sufficient starch, previously dried at 100° C., to make the product weigh *two hundred and fifty grammes.* Mix the powders thoroughly, pass the Extract through a fine sieve and transfer it to small, wide-mouthed bottles and stopper them tightly.

AVERAGE DOSE—Metric, 0.25 Gm.—Apothecaries, 4 grains.

EXTRACTUM PODOPHYLLI

Extract of Podophyllum

Ext. Podophyl.

Podophyllum, in No. 60 powder, *one thousand grammes* . . . **1000 Gm.**
Alcohol,
Water, each, *a sufficient quantity.*

Moisten the ground drug with *three hundred milliliters* of a menstruum consisting of a mixture of *four volumes* of alcohol and *one volume* of

water, place the moistened drug in a percolator and allow it to stand, well covered, for several hours. Then pack it firmly, pour on menstruum to saturate the powder and leave a stratum above it, and, when the liquid begins to drop, close the lower orifice, closely cover the percolator, and macerate for forty-eight hours. Then allow the percolation to proceed, slowly pouring on menstruum of the same proportions of alcohol and water as before until the percolate measures *three thousand milliliters*.

Reserve the first *nine hundred milliliters* of the percolate, evaporate the remainder in a porcelain or enameled dish, at a temperature not exceeding 50° C., to *one hundred milliliters*, add the reserved portion, and evaporate at or below the above mentioned temperature until an extract of pilular consistence remains.

AVERAGE DOSE—Metric, 0.015 Gm.—Apothecaries, ¼ grain.

EXTRACTUM QUASSIÆ

Extract of Quassia

(U.S.P. VIII)

Ext. Quas. Powdered Extract of Quassia

One gramme of the Extract represents *ten grammes* of quassia.

Quassia, in No. 20 powder, *one thousand grammes*	**1000 Gm.**
Water,	
Starch, recently dried at 100° C. and in fine powder, each, *a sufficient quantity,*	
To make *one hundred grammes*	**100 Gm.**

Moisten the powdered drug with *four hundred milliliters* of water, pack it firmly in a conical percolator, and gradually pour water upon it until the percolate passes but slightly imbued with bitterness. Reduce the liquid to three-fourths of its bulk by boiling, and strain, then evaporate the liquid to dryness in a water bath and add enough starch, previously dried at 100° C., to make the product weigh *one hundred grammes*. Mix the powders thoroughly, pass the powdered Extract through a fine sieve, transfer it to small, wide-mouthed bottles, and stopper them tightly.

AVERAGE DOSE—Metric, 0.06 Gm.—Apothecaries, 1 grain.

FERRI OXIDUM SACCHARATUM

Saccharated Ferric Oxide

Ferr. Oxid. Sacch.

Soluble Ferric Oxide Ferrum Oxydatum Saccharatum Eisenzucker

Saccharated Ferric Oxide contains the equivalent of not less than 2.8 per cent. of Fe.

Solution of Ferric Chloride, *three hundred grammes*	**300 Gm.**
Monohydrated Sodium Carbonate, *one hundred and twelve grammes*	**112 Gm.**
Water, *three thousand milliliters*	**3000 mils**
Sodium Hydroxide,	
Sugar, in powder, each, *a sufficient quantity,*	
To make *one thousand grammes*	**1000 Gm.**

Dilute the solution of ferric chloride with *fifteen hundred milliliters* of water and gradually add, with constant stirring, a solution of the monohydrated sodium carbonate in the remainder of the water. Wash the precipitate with water by decantation or siphoning until the washings, when diluted with *five volumes* of water, give only a slight opalescence with silver nitrate T.S. Then collect the precipitate on a cloth strainer, press it out, transfer the magma to a porcelain dish on a water bath, add *five hundred grammes* of sugar and a sufficient quantity (not more than 50 Gm.) of a 15 per cent. solution of sodium hydroxide to produce a clear solution. Evaporate the mixture to dryness on a water bath and if necessary add sufficient sugar to make the product weigh *one thousand grammes.*

Assay.—Dissolve about 8 Gm. of Saccharated Ferric Oxide, accurately weighed, in 50 mils of diluted hydrochloric acid; add 4 Gm. of potassium iodide and allow the solution to stand for thirty minutes at a temperature of 40° C. Cool the solution, dilute it with 100 mils of distilled water and titrate the liberated iodine with tenth-normal sodium thiosulphate V.S., using starch T.S. as an indicator. It shows not less than 2.8 per cent. of Fe.

Each mil of tenth-normal sodium thiosulphate V.S. used corresponds to 0.005584 gramme of Fe. Each gramme of Saccharated Ferric Oxide corresponds to not less than 5.01 mils of tenth-normal sodium thiosulphate V.S.

FLUIDEXTRACTA

Fluidextracts

Fluidextracts are concentrated liquid preparations of vegetable drugs, containing alcohol either as a solvent or as a preservative, and bearing a uniform relation to the drug used so that *one milliliter* of the fluid-

extract approximately represents the activity of *one gramme* of the air-dried and powdered drug of standard quality.

The fluidextracts of The National Formulary, with few exceptions, may be classified according to the menstrua used in the extraction of the drugs and the processes of manufacture employed. Several drugs require special manipulation to obtain satisfactory fluidextracts, and for these appropriate formulas have been devised and are printed in full in the text. The following type processes are described, and in each formula the process to be used is designated by reference to the type process:

Type Process A.—In this class are included those fluidextracts that are made with a menstruum of alcohol or a mixture of alcohol and water by the usual process of percolation.

Type Process B.—In this class are included those fluidextracts in which glycerin or an acid is used in the extraction and two menstrua are successively employed. Menstruum I contains the glycerin or acid in definite proportion to the amount of the drug, and Menstruum II, a mixture of alcohol and water intended for completing the exhaustion of the drug.

Type Process C.—The process of *fractional* or *divided percolation.* This is especially recommended for drugs containing volatile ingredients or constituents injured by exposure to heat. This process may likewise be used as an alternative process in the formulas in which Type Process A is directed.

Type Process D.—In this class are included those fluidextracts in which extraction is effected by infusion and percolation with boiling water, alcohol being added to the concentrated extract as a preservative.

In the preparation of fluidextracts by either Process A, B, or C, the rate of percolation must be carefully controlled and, for the quantities directed in the formulas of The National Formulary, the flow should not exceed ten drops per minute until the reserve percolate is collected, and twenty drops per minute thereafter. With careful percolation, most drugs will be practically exhausted when the percolate from each *one thousand grammes* of drug measures *three thousand milliliters.*

Fluidextracts should be kept in tightly-stoppered containers for one month and then, if perfectly clear, they should be stored in amber-colored bottles protected from sunlight and extremes of temperature. If sedimentation has occurred, the clear portion should be decanted, the remainder filtered and the liquids thoroughly mixed together before storing.

The percentage of alcohol in finished fluidextracts is less than that in the menstrua employed, due to loss by evaporation during manu-

facture, variations in the amount of water in air-dried drugs, the absorption of moisture from the air, and the variable amounts of extractive in different lots of the same drug. The percentage of alcohol in the finished product must therefore be estimated (see Determination of Alcohol in Official Preparations, U. S. Pharmacopœia IX, Part II).

Type Processes

Type Process A.—Moisten *one thousand grammes* of the powdered drug directed with a sufficient quantity of the prescribed menstruum to render it evenly and distinctly damp and to maintain it so after macerating for six hours in a tightly-covered container. Then pack it in a cylindrical percolator and add enough of the menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed slowly, gradually adding more menstruum, until the drug is practically exhausted. Reserve the first *eight hundred and fifty milliliters* of the percolate (unless otherwise specified in the formula); recover the alcohol from the remainder and concentrate the residue to a soft extract at a temperature not exceeding 60° C.; dissolve this in the reserved portion, mix thoroughly, and finally add a sufficient quantity of the menstruum to obtain *one thousand milliliters*, or the volume determined by calculation from the assay.

Type Process B.—Moisten *one thousand grammes* of the powdered drug directed with a sufficient quantity of the prescribed Menstruum I, to render it evenly and distinctly damp and to maintain it so after macerating for six hours in a tightly-covered container; pack it in a cylindrical percolator, add the remainder of Menstruum I, and, when this has just disappeared from the surface, gradually add Menstruum II, constantly maintaining a stratum of liquid above the drug. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours, and then allow the percolation to proceed slowly, gradually adding Menstruum II, until the drug is practically exhausted. Reserve the first *eight hundred and fifty milliliters* of the percolate (unless otherwise specified in the formula); recover the alcohol from the remainder and concentrate the residue to a soft extract at a temperature not exceeding 60° C.; dissolve this in the reserved portion, mix thoroughly, and finally add a sufficient quantity of Menstruum II to obtain *one thousand milliliters*, or the volume determined by calculation from the assay.

Type Process C.—Divide *one thousand grammes* of the drug directed into three portions of *five hundred grammes, three hundred grammes,* and *two hundred grammes,* respectively. Moisten the first portion of the drug (500 Gm.) with a sufficient quantity of the prescribed menstruum to render it evenly and distinctly damp and to maintain it so after macerating for six hours in a tightly-covered container. Then pack it in a cylindrical percolator and add enough of the menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours and then allow the percolation to proceed slowly, gradually adding more of the menstruum. Reserve the first *two hundred milliliters* of percolate and continue the process until the additional percolate measures *fifteen hundred milliliters,* the latter being collected in successive portions of *three hundred milliliters* each.

Moisten the second portion of the drug (300 Gm.) with a sufficient quantity of the percolate collected in the preceding operation immediately after the reserved portion, to render it evenly and distinctly damp and to maintain it so after macerating for six hours in a tightly-covered container. Then pack it in a cylindrical percolator and macerate and percolate as directed for the first part of the drug, using as menstruum the several portions of percolate from the preceding operation in the order in which they have been collected, and, if this be insufficient, follow with some of the original menstruum. Reserve the first *three hundred milliliters* of percolate and continue the process until the drug is practically exhausted, collecting the weaker percolate in successive portions of *two hundred milliliters* each.

Moisten the third portion of the drug (200 Gm.) with a sufficient quantity of the percolate collected in the preceding operation immediately after the reserved portion, to render it evenly and distinctly damp and to maintain it so after macerating for six hours in a tightly-covered container. Then pack it in a cylindrical percolator and macerate and percolate as before, using as menstruum the several portions of percolate from the preceding operation in the order in which they have been collected, and, if this be insufficient, follow with more of the original menstruum. Collect *five hundred milliliters* of percolate and mix this with the two portions previously reserved so as to make *one thousand milliliters* of finished fluidextract.

When Type Process C is directed for fluidextracts which are adjusted by assay to a definite alkaloidal standard, collect only *four hundred and*

twenty milliliters of percolate from the third portion of drug instead of the *five hundred milliliters* directed above. Mix this percolate with the two portions previously reserved, assay a sample of the mixture and then adjust its volume, by the addition of the menstruum directed, so that each *one hundred milliliters* of finished fluidextract will contain the prescribed amount of alkaloid.

Type Process D.—To *one thousand grammes* of the ground drug add *five thousand milliliters* of boiling water, mix thoroughly and allow it to macerate in a covered container for two hours in a warm place. Then transfer the moist drug to a tinned or enameled metallic percolator and allow percolation to proceed, gradually adding boiling water until the drug is practically exhausted. Evaporate the percolate on a water bath or steam bath to the volume specified and when cold add the alcohol directed and mix thoroughly.

FLUIDEXTRACTUM ADONIDIS

Fluidextract of Adonis

Fldext. Adonid.

Adonis, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60) using a mixture of *three volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 0.125 mil—Apothecaries, 2 minims.

FLUIDEXTRACTUM ALETRIDIS

Fluidextract of Aletris

Fldext. Aletrid.

Aletris, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM ANGELICÆ RADICIS

Fluidextract of Angelica Root

Fldext. Angel. Rad.

Angelica Root, in No. 30 powder, *one thousand grammes* . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using alcohol as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM APII FRUCTUS

Fluidextract of Celery Fruit

Fldext. Apii Fruct. Fluidextractum Apii Graveolentis, N.F. III

Celery Fruit, in No. 40 powder, *one thousand grammes* . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using alcohol as the menstruum.

In order to remove any separated oil, after permitting the fluidextract to stand, filter it through an alcohol-wetted filter, rejecting the final few milliliters remaining on the filter with the oil.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM APOCYNI

Fluidextract of Apocynum

(U.S.P. VIII)

Fldext. Apocyn.

Apocynum, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process B (see page 60), using a mixture of *one hundred milliliters* of glycerin, *six hundred milliliters* of alcohol and *three hundred milliliters* of water as Menstruum I, and a mixture of *three volumes* of alcohol and *two volumes* of water as Menstruum II.

Assay.—For a method of assaying Fluidextract of Apocynum see Biological Assays, U. S. Pharmacopœia IX, Part II, page 606, Digitalis group.

AVERAGE DOSE—Metric, 0.75 mil—Apothecaries, 12 minims.

CAUTION—It has been stated that the absorption of Apocynum in the gastro-intestinal tract is uncertain and irregular. To avoid an accumulation of the drug or toxic action, the physician should carefully guard the dosage and determine in each case the tolerance of the patient.

FLUIDEXTRACTUM ARALIÆ

Fluidextract of Aralia

Fldext. Aral. Fluidextractum Araliæ Racemosæ, N.F. III

Aralia, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *two volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM ARNICÆ

Fluidextract of Arnica

Fldext. Arnic. **Fluidextractum Arnicæ Florum, N.F. III**

Arnica, in No. 20 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 0.1 mil—Apothecaries, 1½ minims.

FLUIDEXTRACTUM ASCLEPIADIS

Fluidextract of Asclepias

Fldext. Asclepiad.

Asclepias, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM BAPTISIÆ

Fluidextract of Baptisia

Fldext. Baptis.

Baptisia, in No. 30 powder, *one thousand grammes*. . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *three volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM BERBERIDIS

Fluidextract of Berberis

(U.S.P. VIII)

Fldext. Berberid.

Berberis, in No. 40 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM BOLDI

Fluidextract of Boldo

Fldext. Boldi

Boldo, in No. 20 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using alcohol as the menstruum.

AVERAGE DOSE—Metric, 0.5 mil—Apothecaries, 8 minims.

FLUIDEXTRACTUM BUCHU COMPOSITUM

Compound Fluidextract of Buchu

Fldext. Buchu Co.

Buchu, in No. 40 powder, *six hundred and twenty-five grammes* . **625 Gm.**
Cubeb, in No. 40 powder, *one hundred and twenty-five grammes* . **125 Gm.**
Juniper Berries, in No. 20 powder, *one hundred and twenty-five grammes* . . . . . **125 Gm.**
Uva Ursi, in No. 40 powder, *one hundred and twenty-five grammes* . **125 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *two volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM CALENDULÆ

Fluidextract of Calendula

Fldext. Calend.

Calendula, in No. 20 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using alcohol as the menstruum.

FLUIDEXTRACTUM CALUMBÆ

Fluidextract of Calumba

(U.S.P. VIII)

Fldext. Calumb.

Calumba, in No. 20 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process B (see page 60), using a mixture of *one hundred milliliters* of glycerin, *eight hundred milliliters*

of alcohol and *one hundred milliliters* of water as Menstruum I, and a mixture of *four volumes* of alcohol and *one volume* of water as Menstruum II.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM CASTANEÆ

Fluidextract of Chestnut Leaves

Fldext. Castan.

Castanea, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**
Glycerin, *one hundred milliliters* . . . . . **100 mils**
Alcohol,
Water, each, *a sufficient quantity,*

To make *one thousand milliliters* . . . . . **1000 mils**

Pour *five thousand milliliters* of boiling water upon the powder, allow it to macerate two hours, then express the liquid, transfer the residue to a percolator, and pour water upon it until the powder is practically exhausted. Evaporate the united liquids, on a water bath, to *two thousand milliliters,* allow it to cool, and add *six hundred milliliters* of alcohol. When the insoluble matter has subsided, separate the clear liquid, filter the remainder, evaporate the united liquids to *seven hundred milliliters,* allow to cool, add the glycerin, and, lastly, enough alcohol to make the Fluidextract measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM CATARIÆ

Fluidextract of Catnep

Fldext. Catar.

Catnep, in No. 40 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *three volumes* of alcohol and *four volumes* of water as the menstruum.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM CAULOPHYLLI

Fluidextract of Caulophyllum

Fldext. Caulophyl.

Caulophyllum, in No. 60 powder, *one thousand grammes* . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *three volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 0.5 mil—Apothecaries, 8 minims.

FLUIDEXTRACTUM CHIMAPHILÆ

Fluidextract of Chimaphila

(U.S.P. VIII)

Fldext. Chimaphil.

Chimaphila, in No. 30 powder, *one thousand grammes* . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM CHIONANTHI

Fluidextract of Chionanthus

Fldext. Chionanth.

Chionanthus, in No. 30 powder, *one thousand grammes*. . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *three volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM CHIRATÆ

Fluidextract of Chirata

(U.S.P. VIII)

Fldext. Chirat.

Chirata, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM CINCHONÆ AQUOSUM

Aqueous Fluidextract of Cinchona

Fldext. Cinchon. Aq.

One hundred milliliters of Aqueous Fluidextract of Cinchona yields not less than 4.5 Gm. nor more than 5.5 Gm. of the alkaloids of cinchona, and not less than 12 per cent. of alcohol, by volume.

Red Cinchona, in No. 40 powder, *one thousand grammes* . . .	**1000 Gm.**
Hydrochloric Acid, *thirty milliliters*	**30 mils**
Glycerin, *one hundred and twenty-five milliliters*	**125 mils**
Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*.	**1000 mils**

Mix the hydrochloric acid and glycerin with *five thousand milliliters* of water and moisten the powder with *three hundred and fifty milliliters* of the mixture. Pack the moistened drug in a cylindrical percolator, pour on additional menstruum, and, when the liquid begins to drop from the percolator, close the lower orifice, and having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed slowly until the drug is practically exhausted, first using the remainder of the menstruum prepared above and then a sufficient quantity of water.

Reserve the first *seven hundred milliliters* of the percolate, and evaporate the remainder to *four hundred milliliters* at a temperature not exceeding 80° C., then add the reserved portion and continue the evaporation until the mixed liquid measures *seven hundred milliliters.*

Assay 5 mils of this liquid as directed below and, from the result thus obtained, ascertain by calculation the amount of total cinchona alkaloids in the remainder of the liquid and add enough water and alcohol to make the finished Fluidextract contain 12 per cent., by volume, of absolute alcohol, and 5 Gm. of the total alkaloids of cinchona in each *one hundred milliliters.*

Assay.—From a pipette drop 5 mils of Aqueous Fluidextract of Cinchona evenly over the surface of 10 Gm. of purified sawdust and evaporate it to dryness at a temperature not exceeding 80° C. Transfer the mixture to a 500 mil flask and add 200 mils of a mixture of chloroform, 1 volume, and ether, 2 volumes. Stopper the flask, shake it well, and let it stand ten minutes. Then rinse the dish with 10 mils of ammonia water in divided portions, adding the rinsings to the flask, shake the flask frequently for one hour, and when it has settled, decant 160 mils of the solution, representing 4 mils of the Fluidextract. Filter it through a pledget of purified cotton into a separator, and rinse both cylinder and cotton with ether. Completely extract the alkaloids from the chloroform-ether solution by shaking

out repeatedly with weak sulphuric acid. Collect the acid solutions in a separator, add ammonia water until the solution is distinctly alkaline to litmus, and completely extract the alkaloids by shaking out repeatedly with chloroform. Filter each portion of chloroform as it comes from the separator through a pledget of purified cotton into a tared flask, and wash the funnel and cotton with chloroform. Evaporate off the chloroform, add 5 mils of alcohol to the residue, and again evaporate. Repeat the evaporation with alcohol and dry the residue at 100° C. to constant weight. The weight will be the amount of total alkaloids from 4 mils of the Fluidextract.

Determine the percentage of alcohol by the method given in the U. S. Pharmacopœia IX, Part II.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM COCILLANÆ

Fluidextract of Cocillana

Fldext. Cocillan.

Cocillana, in No. 20 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *three volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM COFFEÆ

Fluidextract of Coffee

Fldext. Coff. Fluidextractum Coffeæ Tostæ, N.F. III

Coffee, in No. 20 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process B (see page 60), using a mixture of *sixty-five milliliters* of glycerin, *two hundred and fifty milliliters* of alcohol, and *six hundred and eighty-five milliliters* of water as Menstruum I and a mixture of *one volume* of alcohol and *three volumes* of water as Menstruum II.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM COLCHICI CORMI

Fluidextract of Colchicum Corm

Fldext. Colch. Corm. Fluidextractum Colchici Radicis, N.F. III

One hundred milliliters of Fluidextract of Colchicum Corm yields not less than 0.31 Gm. nor more than 0.39 Gm. of colchicine.

Colchicum Corm, in No. 40 powder, *one thousand grammes* . . **1000 Gm.**

Prepare a Fluidextract by Type Process A as modified for assayed fluidextracts (see page 60), using a mixture of *two volumes* of alcohol and *one volume* of water as the menstruum. Moisten the drug with *three hundred and fifty milliliters* of this mixture.

After dissolving the soft extract in the reserve, assay 15 mils of this liquid as directed below and, from the result thus obtained, ascertain by calculation the amount of colchicine in the remainder of the liquid and add sufficient menstruum to make the finished Fluidextract contain 0.35 Gm. of colchicine in each *one hundred milliliters*.

Assay.—Introduce 15 mils of Fluidextract of Colchicum Corm into a 500 mil flask, add 10 mils of solution of lead subacetate, previously diluted with 35 mils of distilled water, shake the mixture thoroughly, then add 240 mils of distilled water and again agitate the mixture. Weigh the flask and contents, and digest the mixture at from 60° to 70° C. for three hours, with occasional agitation. Cool, add distilled water to restore the original weight and filter off 200 mils. Add 0.75 Gm. of sodium phosphate to the clear filtrate, shake the mixture frequently during half an hour, and filter off 100 mils representing 5 mils of the Fluidextract. Shake out the alkaloid from the filtrate with chloroform until completely extracted, as shown by testing with iodine T.S. in place of the usual mercuric potassium iodide T.S., and evaporate the chloroform solution, adding about 1 mil of alcohol and again evaporating. Repeat this operation once more and dry the residue to constant weight at 100° C. To this weighed residue contained in a flask add 5 mils of approximately tenth-normal sulphuric acid V.S. and 5 mils of distilled water and heat the mixture for ten minutes to 70° C. Now filter the liquid through a pledget of purified cotton, and wash the flask and cotton with distilled water, rejecting the filtrate and washings and removing as much of the water from the cotton as possible. Dissolve any insoluble residue that may remain on the cotton by washing it first with a little alcohol and then with ether; collect the alcohol-ether washings in the flask, evaporate, and dry the residue to constant weight at 100° C. Deduct this weight from the weight of residue previously obtained. The difference will be the weight of colchicine obtained from 5 mils of Fluidextract of Colchicum Corm.

Average dose—Metric, 0.2 mil—Apothecaries, 3 minims.

FLUIDEXTRACTUM CONDURANGO

Fluidextract of Condurango

Fldext. Condurango

Condurango, in No. 30 powder, *one thousand grammes* . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

Average dose—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM CONII

Fluidextract of Conium

(U.S.P. VIII)

Fldext. Conii

One hundred milliliters of Fluidextract of Conium yields not less than 0.35 Gm. nor more than 0.45 Gm. of coniine.

Conium, in No. 40 powder, *one thousand grammes*. . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process C as modified for assayed fluidextracts (see page 61), using first a mixture of *twenty milliliters* of acetic acid and *nine hundred and eighty milliliters* of diluted alcohol as the menstruum and continuing with diluted alcohol.

Assay 10 mils of this liquid as directed below, and, from the results thus obtained, ascertain by calculation the amount of alkaloid in the remainder of the liquid. Add to this enough menstruum to make the finished Fluidextract contain 0.4 Gm. of coniine in each *one hundred milliliters*.

Assay.—Transfer 10 mils of Fluidextract of Conium by means of a graduated pipette to an evaporating dish. Add 5 drops of diluted hydrochloric acid and evaporate to about 3 mils. Transfer this liquid to a separator, rinse the dish with a few drops of distilled water, and shake the liquid with 25 mils of purified petroleum benzin. When the liquids have separated, reject the benzin solution, and repeat the extraction with two more portions of purified petroleum benzin, rejecting the benzin solutions each time. Then add to the aqueous portion a slight excess of sodium carbonate and extract the alkaline fluid with successive portions of purified petroleum benzin until the alkaloid is entirely removed. Filter the benzin washings from the alkaline solution, add to the filtrate from a burette 5 mils of tenth-normal sulphuric acid V.S. and shake the liquids together. Evaporate off the benzin layer at a gentle heat, and titrate the excess of acid present with fiftieth-normal potassium hydroxide V.S., using cochineal T.S. or methyl red T.S. as indicator. Each milliliter of tenth-normal sulphuric acid V.S. consumed corresponds to 0.0127 Gm. of coniine.

AVERAGE DOSE—Metric, 0.2 mil—Apothecaries, 3 minims.

FLUIDEXTRACTUM CONVALLARIÆ FLORUM

Fluidextract of Convallaria Flowers

Fldext. Conval. Flor. Fluidextractum Convallariæ, N.F. III

Convallaria Flowers, in No. 40 powder, *one thousand grammes*. **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *two volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 0.5 mil—Apothecaries, 8 minims.

FLUIDEXTRACTUM CONVALLARIÆ RADICIS

Fluidextract of Convallaria Root

(U.S.P. VIII)

Fldext. Conval. Rad.

Convallaria Root, in No. 30 powder, *one thousand grammes* . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *three volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 0.5 mil—Apothecaries, 8 minims.

FLUIDEXTRACTUM COPTIS

Fluidextract of Coptis

Fldext. Copt.

Coptis, in No. 40 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM CORNI

Fluidextract of Cornus

Fldext. Corni Fluidextractum Cornus, N.F. III

Cornus, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process B (see page 60), using a mixture of *one hundred and fifty milliliters* of glycerin and *eight hundred and fifty milliliters* of diluted alcohol as Menstruum I and diluted alcohol as Menstruum II.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM CORYDALIS

Fluidextract of Corydalis

Fldext. Corydal.

Corydalis, in No. 20 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *three volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 0.65 mil—Apothecaries, 10 minims.

FLUIDEXTRACTUM CUBEBÆ

Fluidextract of Cubeb

(U.S.P. VIII)

Fldext. Cubeb.

Cubeb, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using alcohol as the menstruum.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM CYPRIPEDII

Fluidextract of Cypripedium

(U.S.P. VIII)

Fldext. Cypriped.

Cypripedium, in No. 40 powder, *one thousand grammes*. . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM DAMIANÆ

Fluidextract of Damiana

Fldext. Damian. Fluidextractum Turneræ, N.F. III

Damiana, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *three volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM DIOSCOREÆ

Fluidextract of Dioscorea

Fldext. Dioscor.

Dioscorea, in No. 30 powder, *one thousand grammes*. . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *four volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM DROSERÆ

Fluidextract of Drosera

Fldext. Droser.

Drosera, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *two volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM DULCAMARÆ

Fluidextract of Bittersweet

Fldext. Dulcam.

Bittersweet, in No. 30 powder, *one thousand grammes* . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM ECHINACEÆ

Fluidextract of Echinacea

Fldext. Echin.

Echinacea, in No. 40 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *four volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM EUONYMI

Fluidextract of Euonymus

(U.S.P. VIII)

Fldext. Euonym.

Euonymus, in No. 40 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *four volumes* of alcohol and *one volume* of water as the

menstruum and reserving the first *eight hundred milliliters* of the percolate.

AVERAGE DOSE—Metric, 0.5 mil—Apothecaries, 8 minims.

CAUTION—It has been stated that the absorption of Euonymus in the gastro-intestinal tract is uncertain and irregular. To avoid an accumulation of the drug or toxic action, the physician should carefully guard the dosage and determine in each case the tolerance of the patient.

FLUIDEXTRACTUM EUPATORII

Fluidextract of Eupatorium

(U.S.P. VIII)

Fldext. Eupator.

Eupatorium, in No. 40 powder, *one thousand grammes* . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum and reserving the first *eight hundred milliliters* of the percolate.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM EUPHORBIÆ PILULIFERÆ

Fluidextract of Euphorbia Pilulifera

Fldext. Euphorb. Pilul.

Euphorbia Pilulifera, in No. 40 powder, *one thousand grammes* **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM FUCI

Fluidextract of Fucus

Fldext. Fuci

Fucus, in No. 30 powder, *one thousand grammes*. . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *three volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 0.65 mil—Apothecaries, 10 minims.

FLUIDEXTRACTUM GALEGÆ

Fluidextract of Galega

Fldext. Galeg.

Galega, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM GERANII

Fluidextract of Geranium

(U.S.P. VIII)

Fldext. Geran.

Geranium, in No. 30 powder, *one thousand grammes*. . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process B (see page 60), using a mixture of *one hundred milliliters* of glycerin, *six hundred milliliters* of alcohol and *three hundred milliliters* of water as Menstruum I and a mixture of *three volumes* of alcohol and *two volumes* of water as Menstruum II. Reserve the first *eight hundred milliliters* of the percolate.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM GOSSYPII CORTICIS

Fluidextract of Cotton Root Bark

Fldext. Gossyp. Cort. Fluidextractum Gossypii Radicis, N.F. III

Cotton Root Bark, in No. 20 powder, *one thousand grammes* . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using alcohol as the menstruum and reserving the first *eight hundred milliliters* of the percolate.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM HAMAMELIDIS FOLIORUM

Fluidextract of Hamamelis Leaves

(U.S.P. VIII)

Fldext. Hamamel. Fol.

Hamamelis Leaves, in No. 30 powder, *one thousand grammes.* **1000 Gm.**

Prepare a Fluidextract by Type Process B (see page 60), using a mixture of *one hundred milliliters* of glycerin, *three hundred milliliters*

of alcohol and *five hundred milliliters* of water as Menstruum I and a mixture of *one volume* of alcohol and *two volumes* of water as Menstruum II.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM HELIANTHEMI

Fluidextract of Helianthemum

Fldext. Helianth.

Helianthemum, in No. 40 powder, *one thousand grammes* . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM HELONIADIS

Fluidextract of Helonias

Fldext. Helon.

Helonias, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM HUMULI

Fluidextract of Hops

Fldext. Humul.

Hops, in No. 20 powder, *one thousand grammes*. . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *five volumes* of alcohol and *three volumes* of water as the menstruum and reserving the first *eight hundred milliliters* of the percolate.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM HYDRANGEÆ

Fluidextract of Hydrangea

Fldext. Hydrang.

Hydrangea, in No. 40 powder, *one thousand grammes* . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *three volumes* of alcohol and *two volumes* of water as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM IRIDIS VERSICOLORIS

Fluidextract of Blue Flag

Fldext. Iris Ver. Fluidextractum Iridis, N.F. III

Blue Flag, in No. 40 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using alcohol as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM JALAPÆ

Fluidextract of Jalap

Fldext. Jalap.

Jalap, in No. 60 powder, *one thousand grammes*. . . . . **1000 Gm.**

Prepare a Fluidextract by intimately mixing the ground drug with *fifteen hundred grammes* of clean sand and proceeding as directed under Type Process A (see page 60), using alcohol as the menstruum.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM JUGLANDIS

Fluidextract of Juglans

Fldext. Jugland.

Juglans, in No. 40 powder, *one thousand grammes*. . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process B (see page 60), using a mixture of *one hundred milliliters* of glycerin, *five hundred milliliters*

of alcohol and *four hundred milliliters* of water as Menstruum I and diluted alcohol as Menstruum II.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM JUNIPERI

Fluidextract of Juniper Berries

Fldext. Junip.

Juniper Berries, in No. 20 powder, *one thousand grammes* . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM KAVÆ

Fluidextract of Kava

Fldext. Kav.

Kava, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *three volumes* of alcohol and *two volumes* of water as the menstruum.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM KOLÆ

Fluidextract of Kola

Fldext. Kol. Fluidextractum Sterculiæ. N.F. III

Kola, in No. 20 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *two volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM KRAMERIÆ

Fluidextract of Krameria

(U.S.P. VIII)

Fldext. Kramer.

Krameria, in No. 40 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process B (see page 60), using a mixture of *one hundred milliliters* of glycerin, *five hundred milliliters* of alcohol and *four hundred milliliters* of water as Menstruum I, and diluted alcohol as Menstruum II. Reserve the first *eight hundred milliliters* of the percolate.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM LAPPÆ

Fluidextract of Lappa

(U.S.P. VIII)

Fldext. Lapp.

Lappa, in No. 30 powder, *one thousand grammes*. . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum and reserving the first *eight hundred milliliters* of the percolate.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM LEPTANDRÆ

Fluidextract of Leptandra

(U.S.P. VIII)

Fldext. Leptand.

Leptandra, in No. 30 powder, *one thousand grammes*. . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM LUPULINI

Fluidextract of Lupulin

(U.S.P. VIII)

Fldext. Lupulin.

Lupulin, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using alcohol as the menstruum.

AVERAGE DOSE—Metric, 0.5 mil—Apothecaries, 8 minims.

FLUIDEXTRACTUM MATICO

Fluidextract of Matico

(U.S.P. VIII)

Fldext. Matic.

Matico, in No. 40 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *three volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM MEZEREI

Fluidextract of Mezereum

(U.S.P. VIII)

Fldext. Mezer.

Mezereum, in No. 30 powder, *one thousand grammes* . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *four volumes* of alcohol and *one volume* of water as the menstruum.

FLUIDEXTRACTUM PARACOTO

Fluidextract of Paracoto

Fldext. Paracot. Fluidextractum Coto, N.F. III

Paracoto, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *nine volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 0.3 mil—Apothecaries, 5 minims.

FLUIDEXTRACTUM PAREIRÆ

Fluidextract of Pareira

(U.S.P. VIII)

Fldext. Pareir.

Pareira, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM PETROSELINI RADICIS

Fluidextract of Parsley Root

Fldext. Petrosel. Rad.

Parsley Root, in No. 40 powder, *one thousand grammes* . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *two volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM PHYTOLACCÆ

Fluidextract of Phytolacca

(U.S.P. VIII)

Fldext. Phytolac.

Phytolacca, in No. 40 powder, *one thousand grammes* . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum and reserving the first *eight hundred milliliters* of the percolate.

	Metric	Apothecaries
AVERAGE DOSE—Emetic,	1 mil	—15 minims.
Alterative,	0.1 mil	—1½ minims.

FLUIDEXTRACTUM PRUNI VIRGINIANÆ

Fluidextract of Wild Cherry

(U.S.P. VIII)

Fldext. Prun. Virg.

Wild Cherry, in No. 20 powder, *one thousand grammes* . . . . . **1000 Gm.**
Glycerin, *two hundred milliliters* . . . . . **200 mils**
Alcohol,
Water, each, *a sufficient quantity,*

To make *one thousand milliliters* . . . . . **1000 mils**

Moisten the drug with a mixture of the glycerin and *four hundred milliliters* of water, pack loosely in a cylindrical percolator and macerate for twenty-four hours. Then add a mixture of *two hundred and fifty milliliters* of alcohol and *one hundred and fifty milliliters* of water, macerate for twenty-four hours longer and then percolate slowly with a mixture of *one volume* of alcohol and *three volumes* of water until the drug is practically exhausted.

Reserve the first *eight hundred and fifty milliliters* of percolate and evaporate the remainder to a soft extract; dissolve this in the reserved portion and add enough of a mixture of *one volume* of alcohol and *three volumes* of water to make the Fluidextract measure *one thousand milliliters*.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM QUASSIÆ

Fluidextract of Quassia

(U.S.P. VIII)

Fldext. Quass.

Quassia, in No. 40 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *one volume* of alcohol and *two volumes* of water as the menstruum.

AVERAGE DOSE—Metric, 0.5 mil—Apothecaries, 8 minims.

FLUIDEXTRACTUM QUERCUS

Fluidextract of Quercus

(U.S.P. VIII)

Fldext. Querc.

Quercus, in No. 40 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process B (see page 60), using a mixture of *one hundred milliliters* of glycerin, *five hundred milliliters* of alcohol and *four hundred milliliters* of water as Menstruum I and diluted alcohol as Menstruum II. Reserve the first *seven hundred milliliters* of the percolate.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM RHAMNI CATHARTICÆ

Fluidextract of Rhamnus Cathartica

Fldext. Rham. Cathart.

Rhamnus Cathartica, in No. 40 powder, *one thousand grammes* . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum and reserving the first *seven hundred and fifty milliliters* of the percolate.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM RHOIS GLABRÆ

Fluidextract of Rhus Glabra

(U.S.P. VIII)

Fldext. Rhois Glab.

Rhus Glabra, in No. 20 powder, *one thousand grammes*. . . . **1000 Gm.**

Prepare a Fluidextract by Type Process B (see page 60), using a mixture of *one hundred milliliters* of glycerin, *five hundred milliliters* of alcohol and *four hundred milliliters* of water as Menstruum I, and diluted alcohol as Menstruum II.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM RUBI

Fluidextract of Rubus

(U.S.P. VIII)

Fldext. Rubi

Rubus, in No. 40 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum and reserving the first *eight hundred milliliters* of the percolate.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM RUMICIS

Fluidextract of Rumex

Fldext. Rumic.

Rumex, in No. 40 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by moistening the ground drug with *three hundred and fifty milliliters* of diluted alcohol and then proceeding as

directed in Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM SANGUINARIÆ

Fluidextract of Sanguinaria

(Replacing U.S.P. VIII)

Fldext. Sanguin.

Sanguinaria, in No. 30 powder, *one thousand grammes* . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process B (see page 60), using *one hundred grammes* of citric acid dissolved in sufficient water to measure *two hundred and fifty milliliters* and mixed with *seven hundred and fifty milliliters* of alcohol as Menstruum I, and a mixture of *three volumes* of alcohol and *one volume* of water as Menstruum II.

AVERAGE DOSE—Metric, 0.1 mil—Apothecaries, 1½ minims.

FLUIDEXTRACTUM SCOPARII

Fluidextract of Scoparius

Fldext. Scopar.

Scoparius, in No. 30 powder, *one thousand grammes*. . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum and reserving the first *seven hundred and fifty milliliters* of the percolate.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM SCUTELLARIÆ

Fluidextract of Scutellaria

(U.S.P. VIII)

Fldext. Scutellar.

Scutellaria, in No. 40 powder, *one thousand grammes* . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum and reserving the first *eight hundred milliliters* of the percolate.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM SENECIONIS

Fluidextract of Senecio

Fldext. Senecion.

Senecio, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *two volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM SERPENTARIÆ

Fluidextract of Serpentaria

(U.S.P. VIII)

Fldext. Serpentar.

Serpentaria, in No. 40 powder, *one thousand grammes* . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *four volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM SOLANI

Fluidextract of Solanum

Fldext. Solan.

Solanum, in No. 40 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *two volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM STILLINGIÆ COMPOSITUM

Compound Fluidextract of Stillingia

Fldext. Stilling. Co.

Stillingia, in No. 30 powder, *two hundred and fifty grammes* . . **250 Gm.**
Corydalis, in No. 30 powder, *two hundred and fifty grammes* . . **250 Gm.**
Blue Flag, in No. 30 powder, *one hundred and twenty-five grammes* . **125 Gm.**

Sambucus, in No. 30 powder, *one hundred and twenty-five grammes* **125 Gm.**
Chimaphila, in No. 30 powder, *one hundred and twenty-five grammes* . . . . . **125 Gm.**
Coriander, in No. 30 powder, *sixty-three grammes* . . . . . **63 Gm.**
Prickly Ash Berries, in No. 30 powder, *sixty-two grammes* . . . **62 Gm.**

Prepare a Fluidextract by Type Process B (see page 60), using a mixture of *two hundred and fifty milliliters* of glycerin, *five hundred milliliters* of alcohol, and *two hundred and fifty milliliters* of water as Menstruum I, and diluted alcohol as Menstruum II.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM STRAMONII

Fluidextract of Stramonium

(U.S.P. VIII)

Fldext. Stramon.

One hundred milliliters of Fluidextract of Stramonium yields not less than 0.22 Gm. nor more than 0.28 Gm. of the alkaloids of stramonium.

Stramonium, in No. 40 powder, *one thousand grammes* . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *two volumes* of alcohol and *one volume* of water as the menstruum.

After dissolving the soft extract in the reserve, assay 10 mils of this liquid as directed below, and, from the result thus obtained, ascertain by calculation the amount of alkaloids in the remainder of the liquid and add to this enough menstruum to make the finished Fluidextract contain 0.25 Gm. of the alkaloids of stramonium in each *one hundred milliliters.*

Assay.—Introduce 10 mils of Fluidextract of Stramonium into a separator and add 10 mils of distilled water and 2 mils of ammonia water. Completely extract the alkaloids by shaking out repeatedly with chloroform and then extract the alkaloids from the chloroform solution by shaking out repeatedly with weak sulphuric acid until the alkaloid is completely removed. Collect the acid washings in a separator, add ammonia water until the solution is decidedly alkaline to litmus, and completely extract the alkaloid by shaking out repeatedly with chloroform. Evaporate the combined chloroform washings to dryness, dissolve the alkaloids from the residue in exactly 5 mils of tenth-normal sulphuric acid V.S. and titrate the excess of acid with fiftieth-normal potassium hydroxide V.S., using cochineal T.S. as indicator.

Each mil of tenth-normal sulphuric acid V.S. consumed corresponds to 28.92 milligrammes of the alkaloids of stramonium.

AVERAGE DOSE—Metric, 0.05 mil—Apothecaries, 1 minim.

FLUIDEXTRACTUM THUJÆ

Fluidextract of Thuja

Fldext. Thuj.

Thuja, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using alcohol as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM THYMI

Fluidextract of Thyme

Fldext. Thym.

Thyme, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process B (see page 60), using a mixture of *one hundred milliliters* of glycerin, *two hundred and fifty milliliters* of alcohol and *six hundred and fifty milliliters* of water as Menstruum I and a mixture of *one volume* of alcohol and *three volumes* of water as Menstruum II.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM TRIFOLII

Fluidextract of Trifolium

Fldext. Trifol.

Trifolium, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum and reserving the first *eight hundred milliliters* of the percolate.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM TRILLII

Fluidextract of Trillium

Fldext. Trill.

Trillium, in No. 40 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *three volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM VALERIANÆ

Fluidextract of Valerian

(U.S.P. VIII)

Fldext. Valer.

Valerian, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *four volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM VERBASCI FOLIORUM

Fluidextract of Mullein Leaves

Fldext. Verbasc. Fol.

Mullein Leaves, in No. 20 powder, *one thousand grammes* . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDEXTRACTUM VERBENÆ

Fluidextract of Verbena

Fldext. Verben.

Verbena, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDEXTRACTUM VIBURNI OPULI

Fluidextract of Viburnum Opulus

Fldext. Viburn. Opul.

Viburnum Opulus, in No. 40 powder, *one thousand grammes* . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using a mixture of *two volumes* of alcohol and *one volume* of water as the menstruum.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDEXTRACTUM ZEÆ

Fluidextract of Zea

Fldext. Zea.

Zea, finely cut, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidextract by Type Process A (see page 60), using diluted alcohol as the menstruum.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

FLUIDGLYCERATA

Fluidglycerates

Fluidglycerates are intended to be of the same drug strength as Fluidextracts. They contain approximately 50 per cent., by volume, of glycerin and no alcohol. The drug should be in a No. 20 or No. 30 powder unless otherwise directed. Fluidglycerates made from drugs that do not require either an acid or an alkaline menstruum may be prepared by the following general process:

General Process

The Drug, in coarse powder, *one thousand grammes*	**1000 Gm.**
Glycerin, *five hundred milliliters*	**500 mils**
Distilled Water, *fifteen hundred milliliters*	**1500 mils**
Chloroform Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix the glycerin and distilled water and moisten the drug thoroughly with a portion of the mixture, then pack it very lightly in a cylindrical percolator, and add enough of the menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for forty-eight hours. Then allow the percolation to proceed slowly until the drug is practically exhausted, using first the remainder of the menstruum and then chloroform water.

Reserve the first *five hundred milliliters* of the percolate and evaporate the remainder on a water bath, the weaker portion first, then the stronger, until reduced to *six hundred milliliters*, then add the reserved portion and continue evaporation until the product measures *one thousand milliliters*. Allow the preparation to stand for a few days, then decant the clear portion and strain the remainder.

FLUIDGLYCERATUM CASCARÆ SAGRADÆ

Fluidglycerate of Cascara Sagrada

Fldglycer. Casc. Sag.

Cascara Sagrada, in No. 20 powder, *one thousand grammes* . . **1000 Gm.**

Prepare a Fluidglycerate by the General Process (see page 90), using *five hundred milliliters* of menstruum to moisten the drug.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDGLYCERATUM CASCARÆ SAGRADÆ AROMATICUM

Aromatic Fluidglycerate of Cascara Sagrada

Fldglycer. Casc. Sag. Arom.

Cascara Sagrada, in No. 20 powder, *seven hundred and fifty grammes*	**750 Gm.**
Fluidglycerate of Glycyrrhiza, *two hundred and fifty milliliters*	**250 mils**
Calcium Oxide, *thirty-eight grammes*	**38 Gm.**
Glycerin, *three hundred and seventy-five milliliters*	**375 mils**
Oil of Fennel, *one milliliter*	**1 mil**
Oil of Clove, *one milliliter*	**1 mil**
Oil of Cinnamon, *one milliliter*	**1 mil**
Water,	
Chloroform Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Slake the calcium oxide, mix it with *fifteen hundred milliliters* of water and stir in the cascara sagrada, moistening the drug evenly and thoroughly. Expose the moist powder to a moderate heat until dry. Mix the glycerin with *eleven hundred and twenty-five milliliters* of water and moisten the cascara sagrada with *six hundred milliliters* of this menstruum, *pack it lightly* in a cylindrical percolator, and add enough of the menstruum to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate the mixture for forty-eight hours. Then allow the percolation to proceed slowly until the drug is practically exhausted, using first the remainder of the menstruum and afterwards chloroform water.

Reserve the first *three hundred and seventy-five milliliters* of the percolate and evaporate the remainder on a water bath, the weaker portion

first, then the stronger, until it is reduced to *four hundred and fifty milliliters*, then add the reserved portion and continue the evaporation until the liquid measures *seven hundred and forty-seven milliliters*. When cold add the fluidglycerate of glycyrrhiza and the volatile oils and mix thoroughly. Allow the preparation to stand for a few days, then decant the clear portion and strain the remainder.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDGLYCERATUM GLYCYRRHIZÆ

Fluidglycerate of Glycyrrhiza

Fldglycer. Glycyrrh. Fluidglycerate of Licorice

Glycyrrhiza, in No. 20 powder, *one thousand grammes*	**1000 Gm.**
Ammonia Water, *sixty milliliters*	**60 mils**
To make *one thousand milliliters*	**1000 mils**

Mix *fifty milliliters* of the ammonia water with *six hundred milliliters* of the glycerin-water menstruum, moisten the drug with the mixture and prepare a Fluidglycerate by the General Process (see page 90), excepting that the mixed percolates are to be evaporated to *nine hundred and ninety milliliters* and the remaining *ten milliliters* of ammonia water added to the cold product.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

FLUIDGLYCERATUM KRAMERIÆ

Fluidglycerate of Krameria

Fldglycer. Kramer.

Krameria, in No. 20 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidglycerate by the General Process (see page 90), using *six hundred milliliters* of menstruum to moisten the drug.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

FLUIDGLYCERATUM RHEI

Fluidglycerate of Rhubarb

Fldglycer. Rhei

Rhubarb, in No. 30 powder, *one thousand grammes* . . . . . **1000 Gm.**

Prepare a Fluidglycerate by the General Process (see page 90), using *five hundred milliliters* of menstruum to moisten the drug.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

GARGARISMA GUAIACI COMPOSITUM

Compound Gargle of Guaiac

Garg. Guaiac Co.

Ammoniated Tincture of Guaiac, *one hundred milliliters* . .	100 mils
Compound Tincture of Cinchona, *one hundred milliliters* . .	100 mils
Clarified Honey, *two hundred milliliters*	200 mils
Potassium Chlorate, *forty grammes*	40 Gm.
Oil of Peppermint, *two milliliters*	2 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Place the clarified honey in a bottle graduated to *one thousand milliliters*, and gradually add the previously mixed oil of peppermint and the tinctures, shaking the bottle after each addition. Dissolve the potassium chlorate in *five hundred milliliters* of warm water, and add this solution to the honey mixture in divided portions, shaking continuously, and finally add sufficient water to make the product measure *one thousand milliliters*. Mix thoroughly.

GELATINUM CHONDRI

Chondrus Gelatin

Gelat. Chondr. Irish Moss Gelatin

Chondrus, *one hundred grammes*	100 Gm.
Water, *a sufficient quantity.*	

Wash the chondrus with cold water, then place it in a suitable vessel, add *five thousand milliliters* of hot water, and heat it on a water bath for fifteen minutes, frequently stirring. Strain the decoction, while hot, through a strong muslin strainer; return the strained, mucilaginous liquid to the water bath, evaporate it to a semi-fluid consistence, then transfer it to shallow, flat-bottomed trays, and evaporate it at a temperature not exceeding 90° C. so that the product may be detached in scales.

GLYCERITUM BISMUTHI

Glycerite of Bismuth

Glycer. Bism.

One hundred milliliters of Glycerite of Bismuth yields not less than 12.8 Gm. of bismuth oxide.

Bismuth Subnitrate, *one hundred and sixty grammes*	**160 Gm.**
Nitric Acid, *one hundred and fifty milliliters*	**150 mils**
Tartaric Acid, *two hundred and thirty-eight grammes*	**238 Gm.**
Sodium Bicarbonate, *three hundred and thirty-four grammes* .	**334 Gm.**
Glycerin,	
Distilled Water, each, *a sufficient quantity,*	
To make about *one thousand milliliters* . .	**1000 mils**

Mix the nitric acid with *three hundred milliliters* of distilled water, in a bottle having a capacity of about *four thousand milliliters*, and dissolve the bismuth subnitrate in the mixture. Then slowly add *six hundred milliliters* of distilled water and dissolve *one hundred and nineteen grammes* of tartaric acid in the mixture. Now add, in small portions, *two hundred grammes* of sodium bicarbonate, shaking frequently and avoiding loss by effervescence, and when all is added fill the bottle with distilled water and mix well. Allow the magma to settle and decant the clear liquid. Again fill the bottle with distilled water and wash the magma by decantation as before, repeating the process until the wash-liquor has but a slightly saline taste. Then pour the magma upon a filter and allow it to drain, rinsing the bottle with a little distilled water.

Transfer the moist magma to a porcelain evaporating dish, add *one hundred and nineteen grammes* of tartaric acid and then slowly, and in small portions, *one hundred and thirty-four grammes* of sodium bicarbonate. Heat the mixture on a steam bath until solution is effected and the total volume is reduced to *four hundred and seventy-five milliliters*. Then add *four hundred and seventy-five milliliters* of glycerin, and, if necessary, enough distilled water to make the solution measure *nine hundred and fifty milliliters* of solution, and filter. Estimate the amount of bismuth oxide in the liquid by the process given below, and from the result thus obtained adjust the strength by evaporation or the addition of equal volumes of glycerin and water so that each *one hundred milliliters* of the finished Glycerite will yield not less than 12.8 Gm. of bismuth oxide.

A colorless or pale yellow liquid, having a slight odor, and a sweet, followed by a saline, taste.

Specific gravity: about 1.378 at 25° C.

Assay.—Dilute 5 mils of Glycerite of Bismuth, accurately measured, with 100 mils of distilled water, in a flask, add two drops of hydrochloric acid, and pass a current of hydrogen sulphide through the solution until it is saturated. Allow the precipitate to settle and decant the supernatant liquid (which should be clear and colorless) through a filter, retaining the precipitate in the flask. Wash the precipitate six times by decantation. Then mix 10 mils of nitric acid with 10 mils of distilled water, heat the mixture to 80° C. and pass it through the filter, collecting it in the flask with the precipitate. Warm the mixture until the bismuth sulphide is dissolved, then filter the liquid through a small filter, and wash the filter and residue with warm 10 per cent. nitric acid until free from bismuth salts. To the clear filtrate add ammonia water until a slight, permanent precipitate appears, then add a slight excess of ammonium carbonate T.S. Heat the liquid on a steam bath during one hour, then collect the precipitate on an analytical filter, wash it thoroughly with distilled water, dry and ignite it in the usual manner. The weight of bismuth oxide so obtained is not less than 0.640 Gm.

GLYCERITUM GUAIACI

Glycerite of Guaiac

Glycer. Guaiac.

Guaiac, in powder, *eighty-five grammes*	**85 Gm.**
Solution of Potassium Hydroxide, *sixty-five milliliters*	**65 mils**
Glycerin, *six hundred milliliters*	**600 mils**
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix the solution of potassium hydroxide with *three hundred milliliters* of water, add the powdered guaiac, and macerate the mixture during twenty-four hours with occasional agitation. Then filter, add the glycerin and sufficient water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

GLYCERITUM PEPSINI

Glycerite of Pepsin

Glycer. Pepsin.

Pepsin, *eighty-five grammes*	**85 Gm.**
Hydrochloric Acid, *ten milliliters*	**10 mils**
Purified Talc, *fifteen grammes*	**15 Gm.**
Glycerin, *five hundred milliliters*	**500 mils**
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix the pepsin with *three hundred and fifty milliliters* of distilled water and the hydrochloric acid, and agitate the mixture until solution has been effected. Then incorporate the purified talc, filter, returning the first portions of the filtrate until it passes through clear, and add enough distilled water through the filter to make the product measure *five hundred milliliters*. To this add the glycerin and mix.

AVERAGE DOSE—Metric, 3 mils—Apothecaries, 45 minims.

GLYCERITUM PICIS LIQUIDÆ

Glycerite of Tar

Glycer. Pic. Liq.

Tar, *sixty-three grammes*	**63 Gm.**
Magnesium Carbonate, *one hundred and twenty-five grammes*	**125 Gm.**
Glycerin, *two hundred and fifty milliliters*	**250 mils**
Alcohol, *one hundred and twenty-five milliliters*	**125 mils**
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Pour *two hundred milliliters* of cold water upon the tar, contained in a mortar, mix them together thoroughly, allow the mixture to settle, and pour off the water. Repeat this operation until the washings show only a slightly acid reaction with litmus. Now triturate the washed tar with the alcohol, gradually incorporate the magnesium carbonate and glycerin, and then add *six hundred and twenty-five milliliters* of water. Pour the mixture upon a filter of loose texture, and, after the liquid portion has passed through, wash the residue on the filter with a mixture of *one volume* of alcohol and *seven volumes* of water, until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

GLYCERITUM TRAGACANTHÆ

Glycerite of Tragacanth

Glycer. Trag.

Tragacanth, in fine powder, *one hundred and twenty-five grammes*	**125 Gm.**
Glycerin, *seven hundred and seventy-five milliliters*	**775 mils**
Water, *one hundred and eighty-five milliliters*	**185 mils**

Mix the tragacanth and glycerin thoroughly, add the water and stir the mixture until a homogeneous, thick paste results.

GLYCERITUM VITELLI

Glycerite of Egg Yolk

Glycer. Vitell. Glyconin

Egg Yolk, *forty-five grammes*	**45 Gm.**
Glycerin, *fifty-five grammes*	**55 Gm.**
To make *one hundred grammes*	**100 Gm.**

Rub the yolk of egg in a mortar, with the glycerin, gradually added, until they are thoroughly mixed, and then strain the product.

GLYCEROGELATINA

Glycerogelatins

Glycerogelatins are soft masses, melting at the body temperature, composed of gelatin, glycerin, water, and a medicament suitable for application in dermatological practice, such as salicylic acid, iodoform, resorcinol, chrysarobin, etc., either by themselves, or with the addition of zinc oxide. They are prepared with Glycerinated Gelatin (U.S.P.) as the vehicle. The formulas which follow serve as types of Glycerogelatins modified to produce masses of different consistence and melting points.

GLYCEROGELATINUM ACIDI SALICYLICI

Salicylic Acid Glycerogelatin

Glycerogel. Acid. Salicyl.

Glycerinated Gelatin, *twenty grammes*	**20 Gm.**
Glycerin, *thirty-five grammes*	**35 Gm.**
Distilled Water, *thirty-five milliliters*	**35 mils**
Salicylic Acid, in very fine powder, *ten grammes*	**10 Gm.**
To make *one hundred grammes*	**100 Gm.**

Mix the salicylic acid thoroughly with the glycerin, add the distilled water, and incorporate this mixture with the glycerinated gelatin previously melted on a water bath. Continue the heat, with stirring, until a homogeneous mixture is obtained, then pour it into chilled molds and allow it to congeal.

GLYCEROGELATINUM IODOFORMI

Iodoform Glycerogelatin

Glycerogel. Iodof.

Glycerinated Gelatin, *ten grammes*	10 Gm.
Glycerin, *fifteen grammes*	15 Gm.
Distilled Water, *sixty-five milliliters*	65 mils
Iodoform, in very fine powder, *ten grammes*	10 Gm.
To make *one hundred grammes*	100 Gm.

Mix the iodoform thoroughly with the glycerin, add the distilled water and incorporate this mixture with the glycerinated gelatin, previously melted on a water bath. Continue the heat, with stirring, until a homogeneous mixture is obtained, then pour it into chilled molds and allow it to congeal.

GLYCEROGELATINUM ZINCI DURUM

Firm Zinc Glycerogelatin

Glycerogel. Zinc. Dur.

Glycerinated Gelatin, *thirty grammes*	30 Gm.
Glycerin, *twenty-five grammes*	25 Gm.
Distilled Water, *thirty-five milliliters*	35 mils
Zinc Oxide, in fine powder, *ten grammes*	10 Gm.
To make *one hundred grammes*	100 Gm.

Mix the zinc oxide thoroughly with the glycerin, add the water and incorporate this mixture with the glycerinated gelatin, previously melted on a water bath. Continue the heat, with stirring, until a homogeneous mixture is obtained, then pour it into chilled molds and allow it to congeal.

GLYCEROGELATINUM ZINCI MOLLE

Soft Zinc Glycerogelatin

Glycerogel. Zinc. Mol.

Glycerinated Gelatin, *twenty grammes*	20 Gm.
Glycerin, *thirty-five grammes*	35 Gm.
Distilled Water, *thirty-five milliliters*	35 mils
Zinc Oxide, in fine powder, *ten grammes*	10 Gm.
To make *one hundred grammes*	100 Gm.

Mix the zinc oxide thoroughly with the glycerin, add the water and incorporate this mixture with the glycerinated gelatin, previously melted on a water bath. Continue the heat, with stirring, until a homogeneous mixture is obtained, then pour it into chilled molds and allow it to congeal.

GOSSYPIUM STYPTICUM

Styptic Cotton

Gossyp. Stypt.

Purified Cotton, *one hundred grammes*	100 Gm.
Solution of Ferric Chloride, *eighty milliliters*	80 mils
Glycerin, *sixteen milliliters*	16 mils
Water, *two hundred and twenty-five milliliters*	225 mils

Mix the solution of ferric chloride, glycerin and water, immerse the purified cotton in this solution, and allow it to remain one hour. Then remove it, press until it has been brought to a weight of *three hundred grammes* and spread it out in thin layers, in a warm place protected from dust and light. When dry transfer it to well-closed glass containers.

INFUSUM BRAYERÆ

Infusion of Brayera

Inf. Brayer.

Brayera, in No. 20 powder, *sixty grammes*	60 Gm.
Boiling Water, *one thousand milliliters*	1000 mils

Pour the boiling water upon the brayera, and allow it to macerate in a covered vessel until cool.

Dispense this Infusion without straining, and only when recently prepared.

AVERAGE DOSE—Metric, 250 mils—Apothecaries, 8 fluidounces.

INFUSUM CINCHONÆ

Infusion of Cinchona

Inf. Cinchon.

Cinchona, in No. 40 powder, *sixty grammes*	60 Gm.
Aromatic Sulphuric Acid, *ten milliliters*	10 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the acid with *five hundred milliliters* of water, and moisten the powder with *thirty milliliters* of the mixture; pack it firmly in a conical glass percolator, and gradually pour upon it, first the remainder of the mixture, and afterwards water, until the infusion measures *one thousand milliliters*.

AVERAGE DOSE—Metric, 50 mils—Apothecaries, 12 fluidrachms.

INFUSUM GENTIANÆ COMPOSITUM

Compound Infusion of Gentian

Inf. Gent. Co.

Gentian, in No. 40 powder, *thirty grammes*	**30 Gm.**
Coriander, in No. 40 powder, *eight grammes*	**8 Gm.**
Bitter Orange Peel, in No. 40 powder, *eight grammes*	**8 Gm.**
Diluted Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Moisten the powdered drugs with diluted alcohol, pack in a percolator, and percolate with diluted alcohol until the product measures *two hundred and fifty milliliters*. To this add sufficient water to make the product measure *one thousand milliliters*.

AVERAGE DOSE—Metric, 15 mils—Apothecaries, 4 fluidrachms.

INFUSUM PRUNI VIRGINIANÆ

Infusion of Wild Cherry

(U.S.P. VIII)

Inf. Prun. Virg.

Wild Cherry, in No. 20 powder, *forty grammes*	**40 Gm.**
Glycerin, *fifty milliliters*	**50 mils**
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Macerate the wild cherry in *nine hundred milliliters* of cold water in a cylindrical percolator during three hours and then draw off and collect the percolate in a receiving bottle containing the glycerin. When the liquid has passed below the surface of the drug, press it down firmly and pour on sufficient water to make the infusion measure *one thousand milliliters* and mix well.

This Infusion should not be dispensed unless it has been recently prepared.

AVERAGE DOSE—Metric, 60 mils—Apothecaries, 2 fluidounces.

INFUSUM ROSÆ COMPOSITUM

Compound Infusion of Rose

Inf. Ros. Co.

Red Rose, *thirteen grammes*	13 Gm.
Diluted Sulphuric Acid, *nine milliliters*	9 mils
Sugar, *forty grammes*	40 Gm.
Boiling Water, *one thousand milliliters*	1000 mils

Pour the boiling water upon the red rose in a glass or porcelain vessel, add the acid, cover the vessel, and digest the drug during one hour. Then dissolve the sugar in the liquid and strain the infusion.

AVERAGE DOSE—Metric, 100 mils—Apothecaries, 3 fluidounces.

INUNCTUM MENTHOLIS

Menthol Inunction

Inunct. Menthol.

Menthol, *five grammes*	5 Gm.
Hydrous Wool Fat, *ninety-five grammes*	95 Gm.
To make *one hundred grammes*	100 Gm.

Rub the menthol with a portion of the hydrous wool fat until a perfectly smooth mixture is obtained, then thoroughly incorporate the remainder of the hydrous wool fat.

Menthol Inunction should be kept in collapsible metal tubes, well sealed, or in small, tightly-stoppered, wide-mouthed bottles.

INUNCTUM MENTHOLIS COMPOSITUM

Compound Menthol Inunction

Inunct. Menthol. Co.

Menthol, *five grammes*	5 Gm.
Methyl Salicylate, *ten grammes*	10 Gm.
Hydrous Wool Fat, *eighty-five grammes*	85 Gm.
To make *one hundred grammes*	100 Gm.

Dissolve the menthol in the methyl salicylate and thoroughly incorporate the mixture in the hydrous wool fat.

Compound Menthol Inunction should be kept in collapsible metal tubes, well sealed, or in small, tightly-stoppered, wide-mouthed bottles.

IODOFORMUM AROMATISATUM

Aromatized Iodoform

Iodof. Arom.

Iodoform, in fine powder, *ninety-six grammes*	**96 Gm.**
Coumarin, in fine powder, *four grammes*	**4 Gm.**
To make *one hundred grammes*	**100 Gm.**

Mix them intimately by trituration.

LAC FERMENTATUM

Fermented Milk

Lac. Ferment. Kumyss

Cow's Milk, *one thousand milliliters*	**1000 mils**
Compressed Yeast, *three grammes*	**3 Gm.**
Sugar, *thirty-five grammes*	**35 Gm.**

Dissolve the sugar in the milk, contained in a strong bottle, add the yeast, close the bottle securely and keep it at a temperature between 23° and 32° C. for six hours; then transfer it to a cool place, preferably a refrigerator.

AVERAGE DOSE—Metric, 250 mils—Apothecaries, 8 fluidounces.

LINIMENTUM ACONITI ET CHLOROFORMI

Liniment of Aconite and Chloroform

Lin. Aconit. et Chlorof.

Fluidextract of Aconite, *forty-five milliliters*	**45 mils**
Alcohol, *eighty milliliters*	**80 mils**
Chloroform, *one hundred and twenty-five milliliters*	**125 mils**
Soap Liniment, *seven hundred and fifty milliliters*	**750 mils**
To make *one thousand milliliters*	**1000 mils**

Mix them.

LINIMENTUM AMMONII IODIDI

Liniment of Ammonium Iodide

Lin. Ammon. Iod.

Iodine, *four grammes*	**4 Gm.**
Oil of Rosemary, *fifteen milliliters*	**15 mils**
Oil of Lavender, *fifteen milliliters*	**15 mils**

Camphor, *thirty-two grammes*	32 Gm.
Ammonia Water, *one hundred and ten milliliters*	110 mils
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the iodine, the oils, and the camphor in *seven hundred and fifty milliliters* of alcohol, then add the ammonia water, and, finally, enough alcohol to make the product measure *one thousand milliliters.* If a precipitate forms, filter the Liniment before dispensing it.

LINIMENTUM OPII COMPOSITUM

Compound Liniment of Opium

Lin. Opii Co.	Canada Liniment
Tincture of Opium, *one hundred milliliters*	100.0 mils
Camphor, *seventeen and five-tenths grammes*	17.5 Gm.
Oil of Peppermint, *twenty-five milliliters*	25.0 mils
Alcohol, *two hundred and fifty milliliters*	250.0 mils
Fresh Egg Albumen, *fifty milliliters*	50.0 mils
Ammonia Water, *three hundred and fifty milliliters*	350.0 mils
Oil of Turpentine, *two hundred and twenty milliliters*	220.0 mils
To make about *one thousand milliliters*	1000 mils

Mix the albumen with the ammonia water and gradually add the oil of turpentine. Shake it thoroughly and add the camphor and oil of peppermint previously dissolved in the alcohol, and finally the tincture of opium. Shake it well before dispensing.

LINIMENTUM SAPONATO-CAMPHORATUM

Camphorated Soap Liniment

Lin. Sapon.-Camph.	Solid Opodeldoc
Monohydrated Sodium Carbonate, *ten grammes*	10 Gm.
Stearic Acid, *fifty grammes*	50 Gm.
Water, *one hundred milliliters*	100 mils
Camphor, in fine powder, *twenty-five grammes*	25 Gm.
Oil of Thyme, *three milliliters*	3 mils
Oil of Rosemary, *six milliliters*	6 mils
Ammonia Water, *fifty milliliters*	50 mils
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the monohydrated sodium carbonate in the water with the aid of heat, add *two hundred milliliters* of alcohol and the stearic acid and warm the mixture until effervescence has ceased and solution results. Add the oils and camphor dissolved in *five hundred milliliters* of alcohol, then the ammonia water and sufficient alcohol to make the product measure *one thousand milliliters.* Finally filter the Liniment while hot.

Pour the filtered liquid into dry, wide-mouthed bottles, stopper these and set them aside to cool.

LINIMENTUM SAPONIS MOLLIS COMPOSITUM

Compound Liniment of Soft Soap

Lin. Sapon. Mol. Co. Tinctura Saponis Viridis Composita, N.F. III

Soft Soap, *one hundred and fifty grammes*	**150 Gm.**
Oil of Cade, *twenty milliliters*	**20 mils**
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Soften the soap by warming it in a dish on a water bath; remove it from the heat, mix it with *seven hundred and fifty milliliters* of alcohol, and, when it has cooled, add the oil of cade. Then filter the liquid and wash the filter with sufficient alcohol to make the product measure *one thousand milliliters.*

LINIMENTUM SINAPIS COMPOSITUM

Compound Liniment of Mustard

Lin. Sinap. Co.

Volatile Oil of Mustard, *thirty milliliters*	**30 mils**
Fluidextract of Mezereum, *two hundred milliliters*	**200 mils**
Camphor, *sixty grammes*	**60 Gm.**
Castor Oil, *one hundred and fifty milliliters*	**150 mils**
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the camphor in *five hundred milliliters* of alcohol, add the fluidextract of mezereum, then the oil of mustard and castor oil, and sufficient alcohol to make the product measure *one thousand milliliters.* Mix thoroughly.

LINIMENTUM TEREBINTHINÆ ACETICUM

Acetic Turpentine Liniment

Lin. Terebinth. Acet.

Linimentum Album Stokes' Liniment St. John Long's Liniment

Oil of Turpentine, *four hundred milliliters*	400 mils
Oil of Lemon, *sixteen milliliters*	16 mils
Acetic Acid, *eighty milliliters*	80 mils
Hen's Egg,	
Rose Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Triturate the contents of two fresh eggs and the yolks of two others with the oil of turpentine and the oil of lemon in a mortar until they are thoroughly mixed. Then incorporate the acetic acid and sufficient rose water to make the product measure *one thousand milliliters.*

Shake the Liniment, whenever any of it is to be dispensed.

LINIMENTUM TIGLII

Liniment of Croton Oil

Lin. Tiglii Linimentum Crotonis

Croton Oil, *thirteen milliliters*	13 mils
Oil of Cajuput, *forty-three milliliters*	43 mils
Alcohol, *forty-four milliliters*	44 mils
To make *one hundred milliliters*	100 mils

Mix them.

LINIMENTUM TIGLII COMPOSITUM

Compound Croton Oil Liniment

Lin. Tiglii Co.

Croton Oil, *twenty milliliters*	20 mils
Oil of Sassafras, *twenty milliliters*	20 mils
Oil of Turpentine, *twenty milliliters*	20 mils
Olive Oil, *forty milliliters*	40 mils
To make *one hundred milliliters*	100 mils

Mix them.

LIQUOR ALUMINI ACETATIS

Solution of Aluminum Acetate

Liq. Alum. Acet. Liquor Burowii Burow's Solution

One hundred milliliters of this solution contains not less than 4.5 and not more than 5.5 Gm. of neutral aluminum acetate [$Al(C_2H_3O_2)_3 = 204.17$].

Lead Acetate, *one hundred and fifty grammes*	**150 Gm.**
Aluminum Sulphate, *eighty-five grammes*	**85 Gm.**
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve each salt in *five hundred milliliters* of water and mix the cold solutions by pouring the lead acetate solution in a thin stream, with constant stirring, into the aluminum sulphate solution. Set the mixture aside in a cold place (about 10° C.) for twenty-four hours, stirring it occasionally, and then siphon off the clear liquid. Transfer the magma to a strainer of fine texture, press it and add enough water through the magma to make the filtered mixed liquids measure *one thousand milliliters.*

Dispense only the clear Solution.

Assay.—Dissolve 1 Gm. of ammonium chloride in 5 mils of the Solution, accurately measured, and add enough distilled water to measure 250 mils. Precipitate the aluminum by the addition of a slight excess of ammonia water to the boiling solution, collect the precipitate on a filter, wash it thoroughly with hot distilled water, ignite it strongly, and weigh the residue. Each milliliter of Solution of Aluminum Acetate corresponds to not less than 0.01126 Gm. nor more than 0.01376 Gm. of aluminum oxide (Al_2O_3).

LIQUOR ALUMINI ACETICO-TARTRATIS

Solution of Aluminum Acetico-Tartrate

Liq. Alum. Acet.-Tart.

Ammonium Alum, *seven hundred and fifty grammes*	**750 Gm.**
Monohydrated Sodium Carbonate, *three hundred grammes.* .	**300 Gm.**
Glacial Acetic Acid, *one hundred and fifty grammes*	**150 Gm.**
Tartaric Acid, *one hundred and thirty-five grammes.*	**135 Gm.**
Water, *a sufficient quantity,*	
To make *one thousand grammes*	**1000 Gm.**

Dissolve the alum and monohydrated sodium carbonate each in *ten thousand milliliters* of water, mix the solutions, and wash the precipitate with water, first by decantation, and afterwards on a strainer, until the washings are free from sulphate. Allow the precipitate to drain and to shrink in volume by exposure on the strainer, then transfer it to a tared

dish, add the glacial acetic acid and the tartaric acid, and apply heat until solution is effected. Finally, evaporate the liquid to *one thousand grammes*.

LIQUOR ALUMINI SUBACETATIS

Solution of Aluminum Subacetate

Liq. Alum. Subacet. Liquor Alumini Acetatis, N.F. III

An aqueous solution, containing not less than 7.5 per cent. nor more than 8 per cent. of basic aluminum acetate [$Al(C_2H_3O_2)_2OH = 162.15$].

Aluminum Sulphate, *three hundred grammes*	**300 Gm.**
Acetic Acid, *three hundred grammes*.	**300 Gm.**
Precipitated Calcium Carbonate, *one hundred and thirty-eight grammes*.	**138 Gm.**
Water, *a sufficient quantity.*	

Dissolve the aluminum sulphate in *nine hundred milliliters* of water, filter the solution, and gradually add the precipitated calcium carbonate, in several portions, with constant stirring. Then slowly add the acetic acid and set the mixture aside for several days, stirring occasionally. Siphon off the clear liquid, transfer the magma to a strainer, press it and add enough water through the magma to bring the filtered, mixed liquids to a specific gravity of 1.045 at 25° C.

Assay.—Add to about 4 mils of the Solution, accurately weighed, 1 Gm. of ammonium chloride and enough distilled water to measure 250 mils. Precipitate the aluminum by the addition of a slight excess of ammonia water to the boiling solution. Collect the precipitate on a filter, wash it thoroughly with hot distilled water, ignite it strongly and weigh the residue. Each gramme of Solution of Aluminum Subacetate corresponds to not less than 0.02363 Gm. nor more than 0.02521 Gm. of aluminum oxide (Al_2O_3).

LIQUOR AMMONII CITRATIS

Solution of Ammonium Citrate

Liq. Ammon. Cit.

Citric Acid, *one hundred and twenty-five grammes*.	**125 Gm.**
Ammonia Water,	
Distilled Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the citric acid in *six hundred milliliters* of distilled water, add *three hundred milliliters* of ammonia water, then cautiously add more ammonia water until a neutral solution is obtained, using litmus paper

as an indicator. Cool the solution and add sufficient distilled water to make the product measure *one thousand milliliters.*

Filter, and preserve this Solution in bottles free from lead.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

LIQUOR ANTISEPTICUS

Antiseptic Solution

(Replacing U.S.P. VIII)

Liq. Antisept.

Boric Acid, *twenty-five grammes*	25.0 Gm.
Thymol, *one gramme*	1.0 Gm.
Eucalyptol, *five milliliters*	5.0 mils
Methyl Salicylate, *one and two-tenths milliliters*	1.2 mils
Oil of Thyme, *three-tenths of a milliliter*	0.3 mil
Menthol, *one gramme*	1.0 Gm.
Sodium Salicylate, *one and two-tenths grammes*	1.2 Gm.
Sodium Benzoate, *six grammes*	6.0 Gm.
Alcohol, *three hundred milliliters*	300.0 mils
Purified Talc, *twenty grammes*	20.0 Gm.
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the boric acid, sodium benzoate and sodium salicylate in *six hundred milliliters* of water and the other ingredients in *two hundred milliliters* of alcohol. Pour the aqueous solution into the alcoholic solution, add the talc and allow the mixture to stand, with occasional agitation, during forty-eight hours. Then filter, returning the first portions of the filtrate until it passes through clear. Add *one hundred milliliters* of alcohol to the filtrate and then sufficient water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

LIQUOR ANTISEPTICUS ALKALINUS

Alkaline Antiseptic Solution

Liq. Antisept. Alk.

Potassium Bicarbonate, *thirty-two grammes*	32.0 Gm.
Sodium Benzoate, *eight grammes*	8.0 Gm.
Sodium Borate, *thirty-two grammes*	32.0 Gm.

Thymol, *two-tenths of a gramme*	0.2 Gm.
Eucalyptol, *two-tenths of a milliliter*	0.2 mil
Oil of Peppermint, *two-tenths of a milliliter*	0.2 mil
Methyl Salicylate, *four-tenths of a milliliter*	0.4 mil
Cudbear, *two grammes*	2.0 Gm.
Alcohol, *sixty milliliters*	60.0 mils
Glycerin, *one hundred and fifty milliliters*	150.0 mils
Magnesium Carbonate, *ten grammes*	10.0 Gm.
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the potassium bicarbonate and sodium borate with *one hundred milliliters* of water, add the glycerin, and when the effervescence has ceased add the mixture to a solution of the sodium benzoate in *five hundred milliliters* of water. Dissolve the thymol, eucalyptol, and oils in the alcohol, add the solution of the salts, the cudbear, and sufficient water to make the product measure *one thousand milliliters.* Incorporate the magnesium carbonate and allow the mixture to stand with occasional shaking during three days. Finally filter the solution, returning the first portions until the filtrate passes through clear.

LIQUOR ARSENICALIS, CLEMENS

Clemens' Solution of Arsenic

Liq. Arsen., Clemens

Liquor Potassii Arsenatis et Bromidi, N.F. III Solution of Potassium Arsenate and Bromide

An aqueous solution containing an amount of arsenic in combination, corresponding to about 1 per cent. of arsenic trioxide [As_2O_3].

Arsenic Trioxide, *ten grammes*	10.0 Gm.
Potassium Bicarbonate, *forty and five-tenths grammes*	40.5 Gm.
Bromine, *five milliliters*	5.0 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Boil the arsenic trioxide with the potassium bicarbonate, and *two hundred milliliters* of water, until solution is effected. Allow this to cool, add *five hundred milliliters* of water, then the bromine, and afterwards sufficient water to make the product measure *one thousand milliliters.* Allow the mixture to stand during twelve hours, agitating it occasionally, then filter.

AVERAGE DOSE—Metric, 0.2 mil—Apothecaries, 3 minims.

LIQUOR AURI ET ARSENI BROMIDI

Solution of Gold and Arsenic Bromide

Liq. Aur. et Arsen. Brom.

Arsenic Trioxide, *two and five-tenths grammes* . . . . . **2.50 Gm.**
Bromauric Acid, *three and twenty-five hundredths grammes* . . **3.25 Gm.**
Bromine, *four grammes* . . . . . **4.00 Gm.**
Distilled Water, *a sufficient quantity,*

To make *one thousand milliliters* . . . . **1000 mils**

Place the arsenic trioxide and bromine in a flask, add *one hundred and thirty-five milliliters* of distilled water and heat the mixture gently until solution is effected and all free bromine has disappeared. Then add bromine water, *twenty* to *thirty* drops at a time, until it is present in slight excess, or until the solution does not become colorless after standing thirty minutes. Transfer the solution to a porcelain dish, expel the excess of bromine with the aid of gentle heat, and dilute it with distilled water to about *six hundred milliliters.* Dissolve the bromauric acid in this solution and add sufficient distilled water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 0.2 mil—Apothecaries, 3 minims.

LIQUOR BISMUTHI

Solution of Bismuth

Liq. Bism.

Glycerite of Bismuth, *one hundred and twenty-five milliliters* . **125 mils**
Alcohol, *one hundred and twenty-five milliliters* . . . . . **125 mils**
Distilled Water, *a sufficient quantity,*

To make *one thousand milliliters* . . . . . **1000 mils**

Mix the glycerite of bismuth with *seven hundred milliliters* of distilled water, then add the alcohol and finally sufficient distilled water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

LIQUOR BROMI

Solution of Bromine

Liq. Brom. Smith's Solution of Bromine

Bromine, *eight and three-tenths milliliters* . . . . . **8.3 mils**
Potassium Bromide, *twelve and five-tenths grammes* . . . . . **12.5 Gm.**
Water, *a sufficient quantity,*

To make *one hundred milliliters* . . . . . **100 mils**

Dissolve the potassium bromide in *eighty milliliters* of water, contained in a bottle, add the bromine, and shake the mixture until solution is effected. Finally add sufficient water to make the product measure *one hundred milliliters.*

Keep the Solution in glass-stoppered bottles in a dark place.

LIQUOR CALCIS SULPHURATÆ

Solution of Sulphurated Lime

Liq. Calc. Sulphurat.

Solution of Oxysulphuret of Calcium Vleminckx' Solution Vleminckx' Lotion

Calcium Oxide, *one hundred and sixty-five grammes*	**165 Gm.**
Sublimed Sulphur, *two hundred and fifty grammes*	**250 Gm.**
Water, *a sufficient quantity,*	
To make about *one thousand milliliters* . .	**1000 mils**

Slake the calcium oxide, mix it with the sulphur and add the mixture gradually to *seventeen hundred and fifty milliliters* of boiling water. Boil this mixture, with frequent agitation, until it is reduced to *one thousand milliliters,* and maintain this volume while boiling one hour, by the addition of water from time to time. Cool and strain the mixture and, having allowed the solution to become clear by standing in a stoppered bottle, decant the clear brown liquid, and preserve it in completely filled and well-stoppered bottles.

LIQUOR CARMINI

Solution of Carmine

Liq. Carmin.

Carmine, *sixty-five grammes.*	**65 Gm.**
Ammonia Water, *three hundred and sixty-five milliliters.* . . .	**365 mils**
Glycerin, *three hundred and sixty-five milliliters*	**365 mils**
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Triturate the carmine to a fine powder, gradually add the ammonia water, and afterwards the glycerin, with constant trituration. Transfer the mixture to a porcelain dish and heat it on a water bath, constantly

stirring, until the liquid is entirely free from ammoniacal odor. Then cool the liquid and add sufficient water to make the finished product measure *one thousand milliliters*.

LIQUOR CHLORI COMPOSITUS

Compound Solution of Chlorine

(Replacing U.S.P. VIII)

Liq. Chlor. Co. , Chlorine Water

An aqueous solution containing, when freshly made, a mixture of chlorine and chlorine oxides equivalent to about 0.35 Gm. of available chlorine in each *one hundred milliliters* of the solution, with some potassium chloride.

Potassium Chlorate, granulated, *three and five-tenths grammes*	**3.5 Gm.**
Hydrochloric Acid, *ten milliliters*	**10.0 mils**
Distilled Water, *a sufficient quantity,*	
To make *five hundred milliliters*	**500 mils**

Graduate a bottle of not less than *one thousand milliliters* capacity to *five hundred milliliters* and fit it with a tightly fitting stopper having two perforations. Through one of these perforations pass a funnel tube fitted with a stop-cock and through the other a straight glass tube about 8 mm. in diameter and 7 cm. in length. Place the potassium chlorate in the bottle and add the hydrochloric acid, previously mixed with *ten milliliters* of distilled water, through the funnel tube. Close the stop-cock and place the bottle on a water bath for a few moments or until the potassium chlorate is dissolved and the bottle completely filled with a gas having a greenish-yellow color. Then remove the bottle from the water bath and add cold distilled water in several portions through the funnel, agitating thoroughly after each addition, until the liquid measures *five hundred milliliters*.

This Solution should not be dispensed unless it has been recently prepared and then only in well-filled, amber-colored bottles.

A yellow liquid with the strong odor and taste of chlorine. One drop when added to 5 mils of potassium iodide T.S. liberates iodine.

Compound Solution of Chlorine when evaporated to dryness on a water bath leaves a white residue consisting mainly of potassium chloride.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

LIQUOR COCCI

Cochineal Color

Liq. Cocci Liquor Coccineus, N.F III

Cochineal, in No. 50 powder, *sixty-five grammes*	65 Gm.
Potassium Carbonate, *thirty-two grammes*	32 Gm.
Alum, *thirty-two grammes*	32 Gm.
Potassium Bitartrate, *sixty-five grammes*	65 Gm.
Glycerin, *five hundred milliliters*	500 mils
Alcohol, *thirty-two milliliters*	32 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Triturate the cochineal intimately with the potassium carbonate, then add *five hundred milliliters* of water, followed by the alum and potassium bitartrate, successively. Heat the mixture to boiling in a capacious vessel, set it aside to cool, then add the glycerin and alcohol and filter the mixture, passing enough water through the filter to make the finished product measure *one thousand milliliters.*

LIQUOR FERRI ACETATIS

Solution of Ferric Acetate

Liq. Ferr. Acet.

An aqueous solution containing about 31 per cent. of anhydrous ferric acetate [$Fe(C_2H_3O_2)_3 = 232.91$], corresponding to about 7.5 per cent. metallic iron (Fe).

Solution of Ferric Sulphate, *eight hundred grammes*	800 Gm.
Glacial Acetic Acid, *two hundred and sixty grammes*	260 Gm.
Ammonia Water, *eight hundred and fifty milliliters*	850 mils
Water,	
Distilled Water, each, *a sufficient quantity,*	
To make *one thousand grammes*	1000 Gm.

Mix the ammonia water with *three thousand milliliters* of cold water, and the solution of ferric sulphate with *ten thousand milliliters* of cold water. Add the latter solution slowly to the diluted ammonia water, stirring constantly. Allow the mixture to stand until the precipitate has subsided as far as practicable, and then decant the supernatant liquid.

Add to the precipitate *six thousand milliliters* of boiling water, mix well, and again set the mixture aside, and decant as before. Repeat the washing with successive portions of boiling water, in the same manner, until the washings are no longer affected by barium chloride T.S. Transfer the mixture to a wet muslin strainer, allow the precipitate to drain completely, and press it, folded in the strainer, until its weight is reduced to *seven hundred grammes* or less. Now add the precipitate gradually to the glacial acetic acid, contained in a tared jar provided with a glass stopper, stirring the mixture after each addition until the magma added is nearly dissolved before adding another portion. Finally, add enough distilled water to make the product weigh *one thousand grammes*, allow it to become clear by subsidence, and decant the clear solution. Keep the product in well-stoppered bottles, in a cool place, protected from light.

Assay.—Add about 2 Gm. of the Solution, accurately weighed, to 2 mils of hydrochloric acid and 10 mils of solution of hydrogen dioxide, and evaporate it to dryness. Dissolve the residue in 2 mils of hydrochloric acid and 40 mils of distilled water, transfer to a flask, add 2 Gm. of potassium iodide, stopper the flask and warm the mixture to 40° C. for thirty minutes. Then cool and titrate the liberated iodine with tenth-normal sodium thiosulphate V.S.

Each mil of tenth-normal sodium thiosulphate V.S. used corresponds to 0.005584 Gm. of metallic iron (Fe).

AVERAGE DOSE—Metric, 0.3 mil—Apothecaries, 5 minims.

LIQUOR FERRI ALBUMINATI

Solution of Albuminate of Iron

Liq. Ferr. Albumin.

Fresh Egg Albumen, *sixty grammes*	60.0 Gm.
Solution of Ferric Oxychloride, *one hundred and twenty milliliters*	120.0 mils
Sodium Citrate, *twelve and five-tenths grammes*	12.5 Gm.
Aromatic Elixir, *four hundred milliliters*	400.0 mils
Alcohol, *one hundred and twenty milliliters*	120.0 mils
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the fresh egg albumen with *one hundred and eighty milliliters* of cold distilled water, add the solution of ferric oxychloride, stirring constantly, and allow the mixture to stand for two hours. Then add the sodium citrate, previously dissolved in *one hundred milliliters* of

distilled water, and, when solution has been effected, add the previously mixed aromatic elixir and alcohol and finally enough distilled water to make the product measure *one thousand milliliters*. Allow the preparation to stand during twenty-four hours and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

LIQUOR FERRI CITRATIS

Solution of Ferric Citrate

Liq. Ferr. Cit.

An aqueous solution containing ferric citrate corresponding to not less than 7.25 per cent. of metallic iron (Fe).

Solution of Ferric Sulphate, *eight hundred and forty grammes* .	**840 Gm.**
Citric Acid, *three hundred grammes*	**300 Gm.**
Ammonia Water, *eight hundred and eighty milliliters*	**880 mils**
Water, *a sufficient quantity,*	
To make *one thousand grammes*	**1000 Gm.**

Mix the ammonia water with *three thousand milliliters* of cold water, and the solution of ferric sulphate with *ten thousand milliliters* of cold water. Add the latter solution slowly to the diluted ammonia water, stirring constantly. Pour the mixture upon a wet muslin strainer, and allow the liquid to run off and the precipitate to drain. Then remove the moist mass from the strainer, mix it well with *six thousand milliliters* of cold water, again pour it on the strainer, and let it drain. Repeat this washing with several successive portions of cold water, in the same manner, until the washings cease to produce more than a faint cloudiness with barium chloride T.S. Then allow the precipitate to drain completely, transfer it to a porcelain dish, add the citric acid, and heat the mixture, on a water bath, to 60° C., stirring constantly until the magma is dissolved. Lastly, filter the liquid, and evaporate it, at the above-mentioned temperature, until it weighs *one thousand grammes*.

Assay.—Add about 2 Gm. of the Solution, accurately weighed, to 2 mils of hydrochloric acid and 10 mils of solution of hydrogen dioxide, and evaporate to dryness. Dissolve the residue in 2 mils of hydrochloric acid and 40 mils of distilled water, transfer to a flask, add 2 Gm. of potassium iodide, stopper the flask and warm the mixture to 40° C. for thirty minutes. Then cool and titrate the liberated iodine with tenth-normal sodium thiosulphate V.S.

Each mil of tenth-normal sodium thiosulphate V.S. used corresponds to 0.005584 Gm. of metallic iron (Fe). Each gramme of Solution of Ferric Citrate corresponds to not less than 12.2 mils of tenth-normal sodium thiosulphate V.S.

AVERAGE DOSE—Metric, 0.6 mil—Apothecaries, 10 minims.

LIQUOR FERRI HYPOPHOSPHITIS

Solution of Ferric Hypophosphite

Liq. Ferr. Hypophos. Solution of Hypophosphite of Iron

Ferric Hypophosphite, *one hundred and sixty-five grammes* . .	165 Gm.
Potassium Citrate, *two hundred and fifteen grammes*	215 Gm.
Glycerin, *one hundred and fifty milliliters*	150 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Triturate the ferric hypophosphite with *three hundred and fifty milliliters* of water to a smooth mixture, then add the potassium citrate and glycerin, and apply a gentle heat, until solution has been effected. Allow the liquid to cool, add sufficient water to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

LIQUOR FERRI NITRATIS

Solution of Ferric Nitrate

Liq. Ferr. Nit.

An aqueous solution containing ferric nitrate [$Fe(NO_3)_3 = 241.87$] corresponding to not less than 1.3 per cent. of metallic iron (Fe).

Solution of Ferric Sulphate, *one hundred and forty-five grammes*	145 Gm.
Ammonia Water, *one hundred and sixty milliliters*	160 mils
Nitric Acid, *seventy-one grammes*	71 Gm.
Distilled Water,	
Water, each, *a sufficient quantity,*	
To make *one thousand grammes*	1000 Gm.

Mix the ammonia water with *five hundred milliliters* of cold water, and the solution of ferric sulphate with *fifteen hundred milliliters* of cold water. Add the latter solution to the diluted ammonia water, stirring constantly. Allow the mixture to stand until the precipitate has subsided as far as practicable, and then decant the supernatant liquid. Add to the precipitate *one thousand milliliters* of cold water, mix well, and again set the mixture aside as before, then decant it. Repeat the treatment with successive portions of cold water, in the same manner, until the washings produce but a slight cloudiness with barium

chloride T.S. Pour the washed ferric hydroxide on a wet muslin strainer, and let it drain thoroughly. Then transfer it to a porcelain dish, add the nitric acid, and stir with a glass rod until a clear solution is obtained. Finally, add sufficient distilled water to make the finished product weigh *one thousand grammes* and filter.

Assay.—Add about 2 Gm. of the Solution, accurately weighed, to 2 mils of hydrochloric acid and 10 mils of solution of hydrogen dioxide and evaporate to dryness. Dissolve the residue in 2 mils of hydrochloric acid and 40 mils of distilled water, transfer to a flask, add 2 Gm. of potassium iodide and warm the mixture to 40° C. for thirty minutes. Cool the solution and titrate the liberated iodine with tenth-normal sodium thiosulphate V.S.

Each mil of tenth-normal sodium thiosulphate V.S. used corresponds to 0.005584 Gm. of metallic iron (Fe).

AVERAGE DOSE—Metric, 0.3 mil—Apothecaries, 5 minims.

LIQUOR FERRI OXYCHLORIDI

Solution of Ferric Oxychloride

Liq. Ferr. Oxychlor.

Solution of Ferric Chloride, *three hundred milliliters*	300 mils
Ammonia Water, *six hundred milliliters*	600 mils
Glycerin, *one hundred and twenty-five milliliters*	125 mils
Hydrochloric Acid, *thirty milliliters*	30 mils
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Add the solution of ferric chloride, previously diluted with *fifteen hundred milliliters* of distilled water, to the ammonia water, previously diluted with *three thousand milliliters* of distilled water, with constant stirring. Allow the mixture to stand until the precipitate has subsided, then decant the supernatant liquid and repeat the washing by decantation with distilled water three times. Now collect the precipitate on a strainer and wash it with distilled water until the washings give only a faint opalescence with silver nitrate T.S. Drain the precipitate, express and discard the excess of liquid, transfer it to an evaporating dish, add the hydrochloric acid, and stir the mixture occasionally during three days. If necessary, warm the mixture to 40° C. to effect solution. Allow it to cool, add the glycerin, and then sufficient distilled water to make the product measure *one thousand milliliters*. Filter and transfer the product to small well-stoppered bottles and keep them in a cool place protected from sunlight.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

LIQUOR FERRI OXYSULPHATIS

Solution of Ferric Oxysulphate

Liq. Ferr. Oxysulph.

Ferrous Sulphate, *one hundred and sixty-five grammes*	165 Gm.
Nitric Acid, *one hundred and sixty-five grammes*	165 Gm.
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the ferrous sulphate in *eight hundred and fifty milliliters* of boiling distilled water in a flask, gradually add the nitric acid, and heat until the escaping vapors cease to have a nitrous odor. When the reaction is complete, allow the liquid to cool and add sufficient distilled water to make the product measure *one thousand milliliters*.

LIQUOR FERRI PEPTONATI

Solution of Peptonate of Iron

Liq. Ferr. Pepton.

Fresh Egg Albumen, *ninety grammes*	90.00 Gm.
Pepsin, *one gramme*	1.00 Gm.
Hydrochloric Acid, *four milliliters*	4.00 mils
Sodium Citrate, *twenty grammes*	20.00 Gm.
Solution of Ferric Oxychloride, *one hundred and twenty milliliters*	120.00 mils
Alcohol, *one hundred and fifty milliliters*	150.00 mils
Syrup, *fifty milliliters*	50.00 mils
Glycerin, *fifty milliliters*	50.00 mils
Oil of Orange, *fifteen-hundredths of a milliliter*	0.15 mil
Acetic Ether, *two-tenths of a milliliter*	0.20 mil
Vanillin, *two-hundredths of a gramme*	0.02 Gm.
Sodium Hydroxide, **Distilled Water,** each, *a sufficient quantity,*	
To make *one thousand milliliters* . . .	1000 mils

Mix the albumen with *four hundred and fifty milliliters* of distilled water and strain. Add the hydrochloric acid and pepsin previously dissolved in *twenty-five milliliters* of distilled water, and digest the mixture at a temperature between 40° and 50° C. until no cloudiness is produced by adding two drops of nitric acid to about *four milliliters* of the solution.

Then filter the peptone solution and neutralize the filtrate with sodium hydroxide previously dissolved in about nine parts of distilled water. Now add the solution of ferric oxychloride and the sodium citrate and warm the mixture until the precipitate has dissolved. When cold add the vanillin, acetic ether, and oil of orange previously dissolved in the alcohol. Finally add the syrup, glycerin and sufficient distilled water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

LIQUOR FERRI PEPTONATI ET MANGANI

Solution of Peptonate of Iron and Manganese

Liq. Ferr. Pepton. et Mangan. Liquor Ferri Peptonati cum Mangano, N.F. III

Fresh Egg Albumen, *ninety grammes*	90.00 Gm.
Pepsin, *one gramme*	1.00 Gm.
Hydrochloric Acid, *four milliliters*	4.00 mils
Soluble Manganese Citrate, *ten grammes*	10.00 Gm.
Sodium Citrate, *thirty-five grammes*	35.00 Gm.
Solution of Ferric Oxychloride, *one hundred and twenty milliliters*	120.00 mils
Alcohol, *one hundred and fifty milliliters*	150.00 mils
Syrup, *fifty milliliters*	50.00 mils
Glycerin, *fifty milliliters*	50.00 mils
Oil of Orange, *fifteen-hundredths of a milliliter*	0.15 mil
Acetic Ether, *two-tenths of a milliliter*	0.20 mil
Vanillin, *two-hundredths of a gramme*	0.02 Gm.
Sodium Hydroxide,	
Distilled Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the albumen with *four hundred and fifty milliliters* of distilled water and strain. Add the hydrochloric acid and pepsin, previously dissolved in *twenty-five milliliters* of distilled water, and digest the mixture at a temperature between 40° and 50° C. until no cloudiness is produced by adding two drops of nitric acid to about *four milliliters* of the solution. Then filter the peptone solution and neutralize the filtrate with sodium hydroxide previously dissolved in about nine parts of distilled water. Now add the solution of ferric oxychloride and the sodium and manganese citrates, previously dissolved in *seventy-five milliliters* of distilled water with the aid of heat, and warm the mixture until the

precipitate has dissolved. When cold add the vanillin, acetic ether, and oil of orange, previously dissolved in the alcohol. Finally add the syrup, glycerin and sufficient distilled water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

LIQUOR FERRI PROTOCHLORIDI

Solution of Ferrous Chloride

Liq. Ferr. Protochlor. Solution of Protochloride of Iron

Iron, in the form of fine, bright, and finely cut wire, *one hundred and sixty grammes*	**160 Gm.**
Hydrochloric Acid, *six hundred and twenty-five grammes*	**625 Gm.**
Glycerin, *two hundred and fifty milliliters*	**250 mils**
Diluted Hypophosphorous Acid, *ten milliliters*	**10 mils**
Distilled Water, *a sufficient quantity,* To make *one thousand milliliters*	**1000 mils**

To the iron contained in a flask, add *three hundred and fifty milliliters* of distilled water, and the hydrochloric acid, and apply a gentle heat until effervescence ceases. Then heat the liquid to boiling, keep it at this temperature for a short time so that the iron may be brought into solution as far as possible, and filter the solution through a pellet of purified cotton placed in the neck of a funnel, washing the flask and cotton with a little distilled water. Evaporate the filtrate on a steam bath until crystals begin to form, and the escaping vapors cease to redden, or only slightly affect, moistened blue litmus paper. Now add the glycerin and the diluted hypophosphorous acid, continue the heat, if necessary, until the crystals are redissolved; when the liquid is cool, add sufficient distilled water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 0.6 mil—Apothecaries, 10 minims.

LIQUOR FERRI SALICYLATIS

Solution of Ferric Salicylate

Liq. Ferr. Salicyl. Salicylated Mixture of Iron

Sodium Salicylate, *one hundred and twenty-five grammes*	**125.0 Gm.**
Tincture of Ferric Citro-Chloride, *one hundred and twenty-five milliliters*	**125.0 mils**

Ammonium Carbonate, *six and five-tenths grammes*	6.5 Gm.
Citric Acid, *eight and five-tenths grammes*	8.5 Gm.
Methyl Salicylate, *two milliliters*	2.0 mils
Glycerin, *one hundred and seventy-five milliliters*	175.0 mils
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the citric acid in *two hundred milliliters* of distilled water, add the ammonium carbonate and dissolve the sodium salicylate in this solution. Then add the tincture of ferric citro-chloride, glycerin and the methyl salicylate, and, after mixing, sufficient distilled water to make the product measure *one thousand milliliters,* and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

LIQUOR GUTTÆ PERCHÆ

Solution of Gutta Percha

Liq. Gut. Perch.

Gutta Percha, in thin slices, *fifteen grammes*	15 Gm.
Chloroform, *one hundred milliliters*	100 mils
Lead Carbonate, in fine powder, *seventeen grammes*	17 Gm.

Add the gutta percha to *seventy-five milliliters* of the chloroform, contained in a bottle, stopper tightly and shake it occasionally until the gutta percha is dissolved. Then add the lead carbonate, previously mixed with the remainder of the chloroform, and, having shaken the whole together several times, at intervals of half an hour, set the mixture aside until the insoluble matter has subsided and the solution has become clear. Decant the clear liquid and preserve it in small, cork-stoppered bottles.

LIQUOR HYDRARGYRI ET POTASSII IODIDI

Solution of Mercury and Potassium Iodide

Liq. Hydrarg. et Pot. Iod.

Solution of Potassium Iodohydrargyrate Channing's Solution

Red Mercuric Iodide, *two and five-tenths grammes*	2.5 Gm.
Potassium Iodide, *two grammes*	2.0 Gm.
Distilled Water, *a sufficient quantity,*	
To make *two hundred and fifty milliliters*	250 mils

Triturate the mercuric iodide and potassium iodide with about *five milliliters* of distilled water until solution has been effected, then add sufficient distilled water to make the product measure *two hundred and fifty milliliters.*

AVERAGE DOSE—Metric, 0.2 mil—Apothecaries, 3 minims.

LIQUOR HYDRARGYRI NITRATIS

Solution of Mercuric Nitrate

(U.S.P. VIII)

Liq. Hydrarg. Nit.

An aqueous solution containing not less than 58 per cent. nor more than 62 per cent. of anhydrous mercuric nitrate [$Hg(NO_3)_2 = 324.62$] and about 11 per cent. of free nitric acid.

Red Mercuric Oxide, *forty grammes*	**40 Gm.**
Nitric Acid, *forty-five grammes*	**45 Gm.**
Distilled Water, *fifteen grammes*	**15 Gm.**
To make *one hundred grammes*	**100 Gm.**

Mix the nitric acid with the distilled water, and dissolve the red mercuric oxide in the mixture. Keep the product in glass-stoppered bottles.

Solution of Mercuric Nitrate is a clear, nearly colorless, heavy liquid having a faint odor of nitric acid, and a strongly acid reaction.

Specific gravity: about 2.086 at 25° C.

No precipitation or cloudiness occurs in the Solution on the addition of distilled water, or of diluted hydrochloric acid (*mercurous salt*).

Assay.—Transfer about 1 Gm. of Solution of Mercuric Nitrate, accurately weighed in a tared and stoppered weighing bottle, to a flask with the aid of about 150 mils of distilled water, add 2 mils of ferric ammonium sulphate T.S. and titrate with tenth-normal potassium sulphocyanate V.S. to the production of a permanent red color. It shows not less than 58 per cent. nor more than 62 per cent. of anhydrous mercuric nitrate.

Each mil of tenth-normal potassium sulphocyanate V.S. used corresponds to 0.016231 Gm. of anhydrous mercuric nitrate [$Hg(NO_3)_2$]. Each gramme of Solution of Mercuric Nitrate corresponds to not less than 35.734 mils nor more than 38.198 mils of tenth-normal potassium sulphocyanate V.S.

LIQUOR HYDRASTINÆ COMPOSITUS

Compound Solution of Hydrastine

Liq. Hydrastin. Co. Colorless Hydrastine Solution

Hydrastine Hydrochloride, *three grammes*	**3 Gm.**
Aluminum Chloride, *three grammes*	**3 Gm.**
Calcium Chloride, *three grammes*	**3 Gm.**
Magnesium Chloride, *three grammes*	**3 Gm.**

Potassium Chloride, *one gramme*	1 Gm.
Glycerin, *five hundred milliliters*	500 mils
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the salts in *four hundred and fifty milliliters* of distilled water, add the glycerin, filter and add sufficient distilled water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric 4 mils—Apothecaries, 1 fluidrachm.

LIQUOR HYPOPHOSPHITUM

Solution of Hypophosphites

Liq. Hypophos.

Calcium Hypophosphite, *thirty-five grammes*	35.0 Gm.
Sodium Hypophosphite, *twenty grammes*	20.0 Gm.
Potassium Hypophosphite, *seventeen and five-tenths grammes*	17.5 Gm.
Hypophosphorous Acid, *six milliliters*	6.0 mils
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the hypophosphites, with the aid of the acid, in sufficient distilled water to make the product measure *one thousand milliliters,* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

LIQUOR HYPOPHOSPHITUM COMPOSITUS

Compound Solution of Hypophosphites

Liq. Hypophos. Co.

Calcium Hypophosphite, *eight and five-tenths grammes*	8.500 Gm.
Potassium Hypophosphite, *eight and five-tenths grammes*	8.500 Gm.
Sodium Hypophosphite, *two and two-tenths grammes*	2.200 Gm.
Ferric Hypophosphite, *four and four-tenths grammes*	4.400 Gm.
Manganese Hypophosphite, *two and two-tenths grammes*	2.200 Gm.
Quinine Hypophosphite, *two and two-tenths grammes*	2.200 Gm.
Strychnine, *sixty-five milligrammes*	0.065 Gm.
Potassium Citrate, *eight and five-tenths grammes*	8.500 Gm.
Hypophosphorous Acid, *six milliliters*	6.000 mils
Orange Flower Water, *thirty-five milliliters*	35.000 mils
Glycerin, *three hundred and fifty milliliters*	350.000 mils
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the calcium, sodium, and potassium hypophosphites in *three hundred milliliters* of distilled water. Dissolve the remaining salts in *two hundred and fifty milliliters* of distilled water with the aid of heat and add the hypophosphorous acid in which the strychnine has previously been dissolved. Mix the two solutions, add the orange flower water and glycerin, and sufficient distilled water to make the product measure *one thousand milliliters;* allow the mixture to stand twelve hours, and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

LIQUOR IODI PHENOLATUS

Phenolated Solution of Iodine

Liq. Iod. Phenol.

Liquor Iodi Carbolatus, N.F. III — Carbolized Solution of Iodine — French Mixture — Boulton's Solution

Compound Solution of Iodine, *fifteen milliliters*	15 mils
Liquefied Phenol, *six milliliters*	6 mils
Glycerin, *one hundred and sixty-five milliliters*	165 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the liquefied phenol with the compound solution of iodine, add the glycerin and sufficient water to make the product measure *one thousand milliliters.* Then expose the liquid to sunlight until it has become colorless.

LIQUOR MAGNESII SULPHATIS EFFERVESCENS

Effervescent Solution of Magnesium Sulphate

Liq. Mag. Sulph. Eff.

Magnesium Sulphate, *twenty-five grammes*	25.0 Gm.
Citric Acid, *four grammes*	4.0 Gm.
Syrup of Citric Acid, *sixty milliliters*	60.0 mils
Potassium Bicarbonate, in crystals, *two and five-tenths grammes*	2.5 Gm.
Distilled Water, *a sufficient quantity,*	
To make about *three hundred and fifty milliliters*	350 mils

Dissolve the magnesium sulphate and the citric acid in *two hundred and fifty milliliters* of distilled water, add the syrup of citric acid and filter the solution into a strong bottle of about *three hundred and sixty*

milliliters capacity. Then add sufficient distilled water to nearly fill the bottle, drop in the potassium bicarbonate and immediately stopper the bottle securely. Lastly, shake the bottle occasionally, until the crystals are dissolved.

AVERAGE DOSE—The contents of a bottle, prepared as above directed.

LIQUOR PANCREATINI

Solution of Pancreatin

Liq. Pancreat. Liquor Pancreaticus, N.F. III Pancreatic Solution

Pancreatin, *seventeen and five-tenths grammes*	**17.5 Gm.**
Sodium Bicarbonate, *fifty grammes*	**50.0 Gm.**
Glycerin, *two hundred and fifty milliliters*	**250.0 mils**
Compound Spirit of Cardamom, *three and five-tenths milliliters*	**3.5 mils**
Alcohol, *sixty-five milliliters*	**65.0 mils**
Magnesium Carbonate, *eight grammes*	**8.0 Gm.**
Sodium Chloride, *five grammes*	**5.0 Gm.**
Chloroform, *two milliliters*	**2.0 mils**
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Triturate the pancreatin, sodium chloride and the sodium bicarbonate gradually with *six hundred and twenty-five milliliters* of distilled water; add the alcohol, compound spirit of cardamom and magnesium carbonate; mix them thoroughly by shaking, and pour the mixture upon a wetted filter, returning the first portions of the filtrate until it passes through clear. Wash the filter with sufficient distilled water to obtain *seven hundred and forty-eight milliliters* of filtrate. To this add the chloroform and glycerin and mix.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

LIQUOR PEPSINI

Solution of Pepsin

Liq. Pepsin.

Glycerite of Pepsin, *fifty milliliters*	**50 mils**
Hydrochloric Acid, *ten milliliters*	**10 mils**
Glycerin, *three hundred and fifteen milliliters*	**315 mils**
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix the glycerite of pepsin, acid and glycerin and add sufficient distilled water to make the product measure *one thousand milliliters*. Mix well, allow it to stand two days, then filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

LIQUOR PEPSINI ANTISEPTICUS

Antiseptic Solution of Pepsin

Liq. Pepsin. Antisept.

Pepsin, *fifty grammes*	50.0 Gm.
Menthol, *five-tenths of a gramme*	0.5 Gm.
Eucalyptol, *five-tenths of a milliliter*	0.5 mil
Methyl Salicylate, *five-tenths of a milliliter*	0.5 mil
Alcohol, *ten milliliters*	10.0 mils
Glycerin, *fifty milliliters*	50.0 mils
Diluted Hydrochloric Acid, *twenty milliliters*	20.0 mils
Purified Talc, *twenty grammes*	20.0 Gm.
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the pepsin, the diluted hydrochloric acid and glycerin in *eight hundred milliliters* of distilled water. Then dissolve the menthol, eucalyptol, and methyl salicylate in the alcohol, mix this liquid with the pepsin solution and add sufficient distilled water to make the product measure *one thousand milliliters*. Finally mix the purified talc with the solution and filter, returning the first portion of the filtrate until the liquid passes through clear.

LIQUOR PEPSINI AROMATICUS

Aromatic Solution of Pepsin

Liq. Pepsin. Arom.

Pepsin, *seventeen and five-tenths grammes*	17.50 Gm.
Oil of Cinnamon, *twenty-five hundredths of a milliliter*	0.25 mil
Oil of Pimenta, *twenty-five hundredths of a milliliter*	0.25 mil
Oil of Clove, *five-tenths of a milliliter*	0.50 mil
Purified Talc, *fifteen grammes*	15.00 Gm.
Alcohol, *thirty-five milliliters*	35.00 mils
Hydrochloric Acid, *ten milliliters*	10.00 mils
Glycerin, *two hundred and fifty milliliters*	250.00 mils
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the pepsin and the hydrochloric acid in *five hundred milliliters* of distilled water. Then add the oils, previously dissolved in the alcohol, the glycerin and sufficient distilled water to make the product measure *one thousand milliliters*. Add the purified talc and filter, returning the first portions of the filtrate until it passes through clear.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

LIQUOR PHOSPHATUM ACIDUS

Acid Solution of Phosphates

Liq. Phos. Acid. Solution of Acid Phosphates

Precipitated Calcium Carbonate, *fifty grammes*	50 Gm.
Magnesium Carbonate, *five grammes*	5 Gm.
Phosphoric Acid, *one hundred and twenty milliliters*	120 mils
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the phosphoric acid with *seven hundred milliliters* of distilled water and dissolve the carbonates in this mixture. Then add sufficient distilled water to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

LIQUOR PHOSPHATUM COMPOSITUS

Compound Solution of Phosphates

Liq. Phos. Co.

Precipitated Calcium Carbonate, *seventy grammes*	70 Gm.
Ferric Phosphate, *thirty-five grammes*	35 Gm.
Ammonium Phosphate, *thirty-five grammes*	35 Gm.
Potassium Bicarbonate, *eight grammes*	8 Gm.
Sodium Bicarbonate, *eight grammes*	8 Gm.
Citric Acid, *one hundred and sixty-four grammes*	164 Gm.
Glycerin, *three hundred and seventy-five milliliters*	375 mils
Phosphoric Acid, *one hundred and forty milliliters*	140 mils
Orange Flower Water, *two hundred and fifty milliliters*	250 mils
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Triturate the precipitated calcium carbonate with the potassium and sodium bicarbonates, citric acid, glycerin and orange flower water, and gradually add the phosphoric acid, stirring until solution has been

effected. Dissolve the ferric phosphate and the ammonium phosphate in *one hundred milliliters* of hot distilled water, cool and add this solution to that previously prepared. Finally add sufficient distilled water to make the product measure *one thousand milliliters*, and filter.

LIQUOR PHOSPHORI

Solution of Phosphorus

Liq. Phosphor. Thompson's Solution of Phosphorus

Phosphorus, *seven hundredths of a gramme*	0.07 Gm.
Spirit of Peppermint, *five-tenths of a milliliter*	0.50 mil
Glycerin, *sixty-four and five-tenths milliliters*	64.50 mils
Dehydrated Alcohol, *a sufficient quantity,*	
To make *one hundred milliliters*	100 mils

Weigh the phosphorus in a dish containing water, which should be counter-balanced after each trial weighing, dry it carefully and quickly with blotting paper and introduce it into a flask containing *thirty-five milliliters* of dehydrated alcohol. Into the neck of the flask insert a perforated cork stopper fitted with a glass tube about *fifty centimeters* in length, to serve as a condenser. Place the flask in a water bath and heat it so that the alcohol shall be kept boiling gently, until the phosphorus is dissolved. Allow the solution to cool and then add the spirit of peppermint and glycerin, and sufficient dehydrated alcohol to make the product measure *one hundred milliliters.*

AVERAGE DOSE—Metric, 0.6 mil—Apothecaries, 10 minims.

LIQUOR PICIS ALKALINUS

Alkaline Solution of Tar

Liq. Pic. Alk.

Tar, *two hundred and fifty grammes*	250 Gm.
Potassium Hydroxide, *one hundred and twenty-five grammes*	125 Gm.
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the potassium hydroxide in *six hundred and twenty-five milliliters* of water, add the tar and agitate until solution is effected. Allow it to stand twenty-four hours, then strain the solution through purified cotton and pass sufficient water through the strainer to make the product measure *one thousand milliliters.*

LIQUOR PICIS CARBONIS

Coal Tar Solution

Liq. Pic. Carbon.

Coal Tar, *two hundred grammes*	200 Gm.
Quillaja, in No. 20 powder, *one hundred grammes*	100 Gm.
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the coal tar and quillaja with *seven hundred milliliters* of alcohol and macerate the mixture during seven days in a closed vessel, with occasional agitation. Then filter and wash the contents of the filter with sufficient alcohol to make the product measure *one thousand milliliters.*

LIQUOR POTASSÆ CHLORINATÆ

Solution of Chlorinated Potassa

Liq. Pot. Chlorinat. Liquor Potassæ Chloratæ Javelle Water

Potassium Carbonate, *fifty-eight grammes*	58 Gm.
Chlorinated Lime, *eighty grammes*	80 Gm.
Water, *a sufficient quantity,*	
To make about *one thousand milliliters*	1000 mils

Mix the chlorinated lime intimately with *four hundred milliliters* of water. Dissolve the potassium carbonate in *three hundred milliliters* of boiling water, and pour the hot solution into the mixture first prepared. Shake the flask or bottle well, stopper it, set it aside to cool, and then add sufficient water to make the product measure *one thousand milliliters* and filter. Keep the Solution in well-stoppered bottles, in a cool place and protected from the light.

LIQUOR SODÆ ET MENTHÆ

Solution of Soda and Mint

Liq. Sod. et Menth. Mistura Sodæ et Menthæ, N.F. III Soda Mint

Sodium Bicarbonate, *fifty grammes*	50 Gm.
Aromatic Spirit of Ammonia, *ten milliliters*	10 mils
Spearmint Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the sodium bicarbonate in *seven hundred and fifty milliliters* of spearmint water, add the aromatic spirit of ammonia, then sufficient spearmint water to make the product measure *one thousand milliliters* and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

NOTE—When preferred, Peppermint Water may be used in place of the Spearmint Water.

LIQUOR SODII ARSENATIS, PEARSON

Pearson's Solution of Sodium Arsenate

Liq. Sod. Arsen. Pearson Liquor Arsenicalis Pearsonii

Exsiccated Sodium Arsenate, *one-tenth of a gramme*	**0.1 Gm.**
Distilled Water, *a sufficient quantity,*	
To make *one hundred grammes*	**100 Gm.**

Dissolve the exsiccated sodium arsenate in the distilled water, and filter the solution.

NOTE—This preparation must not be confounded with the Liquor Sodii Arsenatis, U.S.P., *which is ten times as strong as the above preparation.*

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

LIQUOR SODII BORATIS COMPOSITUS

Compound Solution of Sodium Borate

Liq. Sod. Bor. Co. Dobell's Solution

Sodium Borate, *fifteen grammes*	**15 Gm.**
Sodium Bicarbonate, *fifteen grammes*	**15 Gm.**
Liquefied Phenol, *three milliliters*	**3 mils**
Glycerin, *thirty-five milliliters*	**35 mils**
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the sodium borate and sodium bicarbonate in about *five hundred milliliters* of water, add the glycerin and liquefied phenol, and allow the mixture to stand half an hour or until the effervescence has ceased; then add sufficient water to make the product measure *one thousand milliliters* and filter.

LIQUOR SODII CITRATIS

Solution of Sodium Citrate

Liq. Sod. Cit. Mistura Sodii Citratis Potio Riverii

Citric Acid, *two grammes*	**2.0 Gm.**
Sodium Bicarbonate, *two and five-tenths grammes*	**2.5 Gm.**
Distilled Water, *one hundred milliliters*	**100.0 mils**

Dissolve the citric acid in distilled water contained in a strong bottle, add the sodium bicarbonate, dissolve it by gentle agitation, and immediately stopper the bottle securely.

This preparation should not be dispensed unless it has been recently prepared.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

LIQUOR SODII CITRO-TARTRATIS EFFERVESCENS

Effervescent Solution of Sodium Citro-Tartrate

Liq. Sod. Citro-Tart. Eff.

Sodium Bicarbonate, *twenty-six grammes*	**26 Gm.**
Tartaric Acid, *twenty-four grammes*	**24 Gm.**
Citric Acid, *two grammes*	**2 Gm.**
Syrup of Citric Acid, *fifty milliliters*	**50 mils**
Distilled Water, *a sufficient quantity,*	
To make about *three hundred and fifty milliliters*	**350 mils**

Dissolve *twenty-four grammes* of the sodium bicarbonate in *two hundred and fifty milliliters* of distilled water, add the tartaric and citric acids, and, when they are dissolved, add the syrup of citric acid. Filter the solution into a strong bottle of about *three hundred and sixty milliliters* capacity, and pass enough distilled water through the filter to make the filtrate measure *three hundred milliliters*. Dissolve the remainder of the sodium bicarbonate in *fifty milliliters* of water, filter the solution, pour it on top of the liquid in the bottle, immediately stopper the bottle securely and shake it.

AVERAGE DOSE—The contents of a bottle prepared as above directed.

LIQUOR SODII PHOSPHATIS COMPOSITUS

Compound Solution of Sodium Phosphate

(Replacing U.S.P. VIII)

Liq. Sod. Phos. Co.

Sodium Phosphate, in uneffloresced crystals, *one thousand grammes*	1000 Gm.
Citric Acid, *one hundred and thirty grammes*	130 Gm.
Glycerin, *one hundred and fifty milliliters*	150 mils
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Heat the mixture of sodium phosphate and citric acid in a glass or porcelain vessel on a water bath until liquefied. Filter the solution while hot into a vessel which has just previously been rinsed with boiling water. Finally add the glycerin and sufficient distilled water, just previously boiled, to make the product measure *one thousand milliliters.* Keep the solution in well-stoppered bottles, in a moderately warm place.

It is important that *uneffloresced* crystals of sodium phosphate be used in making this solution, as it is nearly saturated. Should an effloresced salt be employed with its greater percentage of anhydrous sodium phosphate, the solution is likely to crystallize.

Should sodium phosphate in partly effloresced form be used, the salt should be first covered or thoroughly washed with distilled water, and, when the efflorescence has disappeared, the clear crystals should be removed from the water and air-dried; or a small quantity of the sample may be dried with heat, as directed under *Sodii Phosphas Exsiccatus* (U.S.P.) and the percentage of moisture determined. When the amount of water present is known, a proportionately smaller quantity of the effloresced salt may be taken.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

LIQUOR STRYCHNINÆ ACETATIS

Solution of Strychnine Acetate

Liq. Strych. Acet. Hall's Solution of Strychnine

Strychnine, *one hundred and seventy-eight milligrammes*	0.178 Gm.
Diluted Acetic Acid, *three and five-tenths milliliters*	3.500 mils
Alcohol, *twenty-five milliliters*	25.000 mils
Compound Tincture of Cardamom, *one milliliter*	1.000 mil
Distilled Water, *a sufficient quantity,*	
To make *one hundred milliliters*	100 mils

Dissolve the strychnine in the diluted acetic acid, add about *fifty milliliters* of distilled water, then the alcohol, compound tincture of cardamom, and sufficient distilled water to make the product measure *one hundred milliliters*, and filter.

AVERAGE DOSE—Metric, 0.6 mil—Apothecaries, 10 minims.

LIQUOR ZINCI ET ALUMINI COMPOSITUS

Compound Solution of Zinc and Aluminum

Liq. Zinc. et Alumin. Co.

Zinc Sulphate, *two hundred grammes*	200.0 Gm.
Aluminum Sulphate, *two hundred grammes*	200.0 Gm.
Betanaphthol, *six-tenths of a gramme*	0.6 Gm.
Oil of Thyme, *two milliliters*	2.0 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the zinc sulphate and the aluminum sulphate in *eight hundred milliliters* of water, by the aid of heat, add the betanaphthol and oil of thyme, and shake the mixture occasionally, in a stoppered bottle, until it is cold. Add sufficient water to make the product measure *one thousand milliliters*, mix well, set it aside for two days, and then filter the solution through a wetted filter.

LIQUOR ZINCI ET FERRI COMPOSITUS

Compound Solution of Zinc and Iron

Liq. Zinc. et Ferr. Co. Deodorant Solution

Zinc Sulphate, *two hundred grammes*	200.0 Gm.
Ferrous Sulphate, *two hundred grammes*	200.0 Gm.
Copper Sulphate, *sixty-five grammes*	65.0 Gm.
Betanaphthol, *six-tenths of a gramme*	0.6 Gm.
Oil of Thyme, *two milliliters*	2.0 mils
Hypophosphorous Acid, *four milliliters*	4.0 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the zinc sulphate, ferrous sulphate, and copper sulphate in *eight hundred milliliters* of boiling water, add the betanaphthol, and oil of thyme, and shake the mixture occasionally, in a stoppered bottle, until it is cold. Then add the hypophosphorous acid and sufficient water to make the product measure *one thousand milliliters* and filter.

LOTIO AMMONIACALIS CAMPHORATA

Ammoniated Camphor Wash

Lot. Ammon. Camph.

Aqua Sedativa, N.F. III Sedative Water Eau Sédative de Raspail

Sodium Chloride, *sixty grammes*	60 Gm.
Ammonia Water, *sixty milliliters*	60 mils
Spirit of Camphor, *ten milliliters*	10 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the sodium chloride in about *nine hundred milliliters* of water, add the spirit of camphor, then the ammonia water, and finally sufficient water to make the product measure *one thousand milliliters.*

Keep it in well-stoppered bottles and shake the Lotion before it is dispensed.

LOTIO FLAVA

Yellow Lotion

Lot. Flav. Yellow Wash Aqua Phagedænica Flava

Corrosive Mercuric Chloride, *three grammes*	3 Gm.
Boiling Water, *thirty-five milliliters*	35 mils
Solution of Calcium Hydroxide, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the corrosive mercuric chloride in the boiling water, and add the solution gradually, with constant agitation, to sufficient solution of calcium hydroxide to make the product measure *one thousand milliliters.*

Shake the Lotion thoroughly before it is dispensed.

LOTIO NIGRA

Black Lotion

Lot. Nigr. Black Wash Aqua Phagedænica Nigra

Mild Mercurous Chloride, *eight and seventy-five hundredths grammes*	8.75 Gm.
Water, *fifteen milliliters*	15.00 mils
Solution of Calcium Hydroxide, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Triturate the mild mercurous chloride with the water, and gradually add sufficient solution of calcium hydroxide, with trituration, to make the product measure *one thousand milliliters*.

Shake the Lotion thoroughly before it is dispensed.

LOTIO PLUMBI ET OPII

Lotion of Lead and Opium

Lot. Plumb. et Opii — Lead and Opium Wash

Lead Acetate, *seventeen and five-tenths grammes*	**17.5 Gm.**
Tincture of Opium, *thirty-five milliliters*	**35.0 mils**
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the lead acetate in about *six hundred and fifty milliliters* of water, add the tincture of opium, and sufficient water to make the product measure *one thousand milliliters*.

Shake the Lotion thoroughly before it is dispensed.

MAGMA FERRI HYDROXIDI

Ferric Hydroxide Magma

Magm. Ferr. Hydrox. — Ferri Hydroxidum, U.S.P. VIII

Ferric Hydroxide

Solution of Ferric Sulphate, *one hundred milliliters*	**100 mils**
Ammonia Water, *one hundred and thirty-eight milliliters*	**138 mils**
Water, *a sufficient quantity,*	
To make *three hundred grammes*	**300 Gm.**

Add the solution of ferric sulphate, previously diluted with *one thousand milliliters* of cold water, to the ammonia water, previously diluted with *five hundred milliliters* of cold water, stirring constantly. As soon as the precipitate has subsided, draw off the clear liquid by means of a siphon, then mix the precipitate intimately with about *one thousand milliliters* of cold water, again draw off the clear liquid after subsidence of the precipitate, and repeat this operation, until a portion of the decanted liquid gives not more than a slight cloudiness with barium chloride T.S. Finally, transfer the precipitate to a wet strainer, and, after it has drained, mix it with sufficient cold water to make the mixture weigh *three hundred grammes*.

MASSA COPAIBÆ

Mass of Copaiba

Mass. Copaib. Solidified Copaiba

Copaiba, *ninety-four grammes*	**94 Gm.**
Magnesium Oxide, *six grammes*	**6 Gm.**
Water, *a sufficient quantity,*	
To make about *one hundred grammes*	**100 Gm.**

Triturate the magnesium oxide with a little water, in a dish until the powder is uniformly dampened throughout. Then gradually incorporate the copaiba with it so that a uniform mixture results, place the dish on a water bath and heat during half an hour, frequently stirring. Lastly, transfer the mixture to a suitable vessel, and set it aside until the mass has acquired a pilular consistence.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

MEL ROSÆ ET SODII BORATIS

Honey of Rose and Sodium Borate

Mel. Ros. et Sod. Bor. Honey of Rose with Borax

Sodium Borate, in fine powder, *ten grammes*	**10 Gm.**
Glycerin, *five grammes*	**5 Gm.**
Honey of Rose, *eighty-five grammes*	**85 Gm.**
To make *one hundred grammes*	**100 Gm.**

Mix the sodium borate with the glycerin, add the honey of rose, and stir until solution is effected.

MEL SODII BORATIS

Honey of Sodium Borate

Mel. Sod. Bor. Mel Boracis Honey and Borax

Sodium Borate, in fine powder, *ten grammes*	**10 Gm.**
Glycerin, *five grammes*	**5 Gm.**
Clarified Honey, *eighty-five grammes*	**85 Gm.**
To make *one hundred grammes*	**100 Gm.**

Mix the sodium borate with the glycerin, add the honey, and stir until solution is effected.

MENTHOL CAMPHORATUM

Camphorated Menthol

Menthol. Camph. Campho-Menthol, N.F. III Camphor and Menthol

Camphor, *forty-seven and five-tenths grammes*	47.5 Gm.
Menthol, *forty-seven and five-tenths grammes*	47.5 Gm.
Alcohol, *five grammes*	5.0 Gm.
To make *one hundred grammes*	100 Gm.

Reduce the camphor to a powder by triturating it with about one-tenth of its weight of menthol, then add the rest of the menthol and continue trituration until the mixture is completely liquefied; finally add the alcohol.

Camphorated Menthol may also be prepared by placing the camphor and menthol in a suitable bottle, tightly stoppering it and partially immersing it in hot water until, after occasional agitation, the mixture is completely liquefied, and finally adding the alcohol.

MISTURA ADSTRINGENS

Astringent Mixture

Mist. Adstring.

Mistura Adstringens et Escharotica, N.F. III Villate's Mixture

Solution of Lead Subacetate, *one hundred milliliters*	100 mils
Copper Sulphate, *sixty-five grammes*	65 Gm.
Zinc Sulphate, *sixty-five grammes*	65 Gm.
Diluted Acetic Acid, *eight hundred and fifty milliliters*	850 mils

Dissolve the copper sulphate and zinc sulphate in the diluted acetic acid, add the solution of lead subacetate, and agitate thoroughly.

Shake this preparation well before dispensing it, so that the precipitate will be uniformly distributed.

MISTURA AMMONII CHLORIDI

Mixture of Ammonium Chloride

Mist. Ammon. Chlor. Mistura Solvens Simplex

Ammonium Chloride, *twenty-five grammes*	25 Gm.
Pure Extract of Glycyrrhiza, *twenty-five grammes*	25 Gm.
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the ammonium chloride and the extract in sufficient water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

MISTURA CAMPHORÆ ACIDA

Acid Camphor Mixture

Mist. Camph. Acid. Mistura Antidysenterica Hope's Mixture

Nitric Acid, *seventeen and five-tenths milliliters*	**17.5 mils**
Tincture of Opium, *twelve milliliters*	**12.0 mils**
Camphor Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Add the nitric acid, and then the tincture of opium, to sufficient camphor water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

MISTURA CAMPHORÆ AROMATICA

Aromatic Camphor Mixture

Mist. Camph. Arom. Parrish's Camphor Mixture

Compound Tincture of Lavender, *two hundred and fifty milliliters*	**250 mils**
Sugar, *thirty-five grammes*	**35 Gm.**
Camphor Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix the compound tincture of lavender with *five hundred milliliters* of camphor water, dissolve the sugar in the mixture, and add sufficient camphor water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

MISTURA CARMINATIVA

Carminative Mixture

Mist. Carminat. Dalby's Carminative

Magnesium Carbonate, *sixty-five grammes*	**65.0 Gm.**
Potassium Carbonate, *three grammes*	**3.0 Gm.**

Tincture of Opium, *twenty-five milliliters*	25.0 mils
Oil of Caraway, *five-tenths of a milliliter*	0.5 mil
Oil of Fennel, *five-tenths of a milliliter*	0.5 mil
Oil of Peppermint, *five-tenths of a milliliter*	0.5 mil
Syrup, *one hundred and sixty milliliters*	160.0 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Triturate the oils with the magnesium carbonate and *seven hundred and fifty milliliters* of water, gradually added. Then add the other ingredients, and, lastly, sufficient water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Infants, Metric, 0.5 mil—Apothecaries, 8 minims.

MISTURA CHLORALIS ET POTASSII BROMIDI COMPOSITA

Compound Mixture of Chloral and Potassium Bromide

Mist. Chloral. et Pot. Brom. Co. Chloral and Bromide Compound

Hydrated Chloral, *two hundred grammes*	200 Gm.
Potassium Bromide, *two hundred grammes*	200 Gm.
Extract of Cannabis, *two grammes*	2 Gm.
Extract of Hyoscyamus, *two grammes*	2 Gm.
Pumice, in fine powder and well washed, *twenty grammes*	20 Gm.
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Triturate the extracts in a mortar with the pumice, gradually added, until they are thoroughly mixed. Dissolve the hydrated chloral and potassium bromide in *six hundred and twenty-five milliliters* of water, previously heated to about 90° C., and gradually add the hot solution to the extracts and pumice with constant trituration. Set the mixture aside during twenty-four hours, shaking it occasionally, then filter and add sufficient water, through the filter, to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

MISTURA CHLOROFORMI ET MORPHINÆ COMPOSITA

Compound Mixture of Chloroform and Morphine

Mist. Chlorof. et Morph. Co.

Mistura Chloroformi et Cannabis Indicæ Composita, N.F. III
Chloroform Anodyne

Chloroform, *one hundred and twenty-five milliliters*	125.0 mils
Ether, *thirty-two and five-tenths milliliters*	32.5 mils
Tincture of Cannabis, *one hundred and eighty-five milliliters*	185.0 mils
Tincture of Capsicum, *twenty-five milliliters*	25.0 mils
Morphine Sulphate, *two and five-tenths grammes*	2.5 Gm.
Oil of Peppermint, *two milliliters*	2.0 mils
Glycerin, *one hundred and twenty-five milliliters*	125.0 mils
Water, *sixty-five milliliters*	65.0 mils
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the oil of peppermint in *five hundred milliliters* of alcohol, add the chloroform, ether, and the tinctures and mix well. Then add the morphine sulphate, previously dissolved in the water and glycerin, to this solution, and finally sufficient alcohol to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

MISTURA COPAIBÆ

Copaiba Mixture

Mist. Copaib. Lafayette Mixture

Copaiba, *one hundred and twenty-five milliliters*	125 mils
Spirit of Nitrous Ether, *one hundred and twenty-five milliliters*	125 mils
Compound Tincture of Lavender, *one hundred and twenty-five milliliters*	125 mils
Solution of Potassium Hydroxide, *thirty-two milliliters*	32 mils
Syrup, *three hundred milliliters*	300 mils
Mucilage of Acacia, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the copaiba thoroughly with the solution of potassium hydroxide and the spirit of nitrous ether, then add the compound tincture of

lavender and, lastly, the syrup and mucilage of acacia. Mix the whole thoroughly by shaking.

Shake this Mixture well before it is dispensed.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

MISTURA COPAIBÆ ET OPII

Mixture of Copaiba and Opium

Mist. Copaib. et Opii	Chapman's Mixture
Copaiba, *two hundred and fifty milliliters*	250 mils
Spirit of Nitrous Ether, *two hundred and fifty milliliters*	250 mils
Compound Tincture of Lavender, *sixty-five milliliters*	65 mils
Tincture of Opium, *thirty-two milliliters*	32 mils
Mucilage of Acacia, *one hundred and twenty-five milliliters*	125 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the copaiba and mucilage of acacia thoroughly by trituration and gradually add *two hundred and fifty milliliters* of water, continuing the trituration. When a smooth emulsion is obtained, gradually add, in the same manner, the tincture of opium, compound tincture of lavender, and then the spirit of nitrous ether. Finally add sufficient water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

MISTURA FERRI COMPOSITA

Compound Iron Mixture

(U.S.P. VIII)

Mist. Ferr. Co.	Griffith's Mixture
Ferrous Sulphate, in clear crystals, *six grammes*	6 Gm.
Myrrh, in small pieces, *eighteen grammes*	18 Gm.
Sugar, *eighteen grammes*	18 Gm.
Potassium Carbonate, *eight grammes*	8 Gm.
Spirit of Lavender, *sixty milliliters*	60 mils
Rose Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Rub the myrrh, sugar and potassium carbonate in a mortar, with *seven hundred milliliters* of rose water, at first very gradually added, so

that a uniform mixture may result. Transfer this to a graduated vessel, add the spirit of lavender, then the ferrous sulphate, previously dissolved in about *fifty milliliters* of rose water, and, lastly, enough rose water to make the product measure *one thousand milliliters*. Mix the whole thoroughly.

This Mixture should not be dispensed unless it has been recently prepared.

AVERAGE DOSE—Metric, 15 mils—Apothecaries, 4 fluidrachms.

MISTURA GUAIACI

Mixture of Guaiac

Mist. Guaiac.

Tincture of Guaiac, *one hundred and twenty-five milliliters* . .	**125 mils**
Clarified Honey, *two hundred and fifty milliliters*	**250 mils**
Cinnamon Water, *a sufficient quantity,*	
To make *one thousand milliliters*.	**1000 mils**

Place the honey in a mortar and gradually add the tincture of guaiac with brisk trituration. Then add sufficient cinnamon water, in portions, to make the product measure *one thousand milliliters*, mixing each portion thoroughly by trituration before adding the next.

Shake this Mixture well before it is dispensed.

AVERAGE DOSE—Metric, 15 mils—Apothecaries, 4 fluidrachms.

MISTURA MAGNESIÆ, ASAFŒTIDÆ ET OPII

Mixture of Magnesia, Asafetida and Opium

Mist. Mag., Asafœt. et Opii

Mistura Magnesiæ et Asafœtidæ, N.F. III — Dewees' Carminative

Magnesium Carbonate, *fifty grammes*	**50 Gm.**
Tincture of Asafetida, *seventy-five milliliters*.	**75 mils**
Tincture of Opium, *ten milliliters*.	**10 mils**
Sugar, *one hundred grammes*	**100 Gm.**
Water, *a sufficient quantity,*	
To make *one thousand milliliters*.	**1000 mils**

Rub the magnesium carbonate and sugar in a mortar, with the tincture of asafetida and the tincture of opium. Then gradually add sufficient water to make the product measure *one thousand milliliters*.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

MISTURA OLEI PICIS

Mixture of Oil of Tar

Mist. Ol. Pic. Mistura Picis Liquidæ Tar Mixture

Rectified Oil of Tar, *thirty-five milliliters*	35 mils
Pure Extract of Glycyrrhiza, *sixty-five grammes*	65 Gm.
Sugar, *two hundred and fifty grammes*	250 Gm.
Chloroform, *ten milliliters*	10 mils
Oil of Peppermint, *three milliliters*	3 mils
Alcohol, *one hundred and sixty milliliters*	160 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Add the pure extract of glycyrrhiza and sugar to *five hundred milliliters* of water, contained in a covered vessel, and heat the mixture until the extract and sugar are dissolved. Cool and add the rectified oil of tar, the chloroform and the oil of peppermint, previously dissolved in the alcohol, and, lastly, sufficient water to make the product measure *one thousand milliliters.*

Shake this Mixture before it is dispensed.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

MISTURA OLEO-BALSAMICA

Oleo-Balsamic Mixture

Mist. Ol.-Balsam.

Oil of Lavender, *four milliliters*	4 mils
Eugenol, *four milliliters*	4 mils
Oil of Cinnamon, *four milliliters*	4 mils
Oil of Thyme, *four milliliters*	4 mils
Oil of Lemon, *four milliliters*	4 mils
Oil of Myristica, *four milliliters*	4 mils
Balsam of Peru, *sixteen milliliters*	16 mils
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the oils, eugenol and balsam of Peru in *nine hundred milliliters* of alcohol, filter, and add sufficient alcohol, through the filter, to make the product measure *one thousand milliliters.*

MISTURA OPII ET CHLOROFORMI COMPOSITA

Compound Mixture of Opium and Chloroform

Mist. Opii et Chlorof. Co. Squibb's Diarrhœa Mixture

Tincture of Opium, *two hundred milliliters*	200 mils
Spirit of Camphor, *two hundred milliliters*	200 mils
Tincture of Capsicum, *one hundred milliliters*	100 mils
Chloroform, *eighty milliliters*	80 mils
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix them.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

MISTURA OPII ET RHEI COMPOSITA

Compound Mixture of Opium and Rhubarb

Mist. Opii et Rhei Co. Sun Cholera Mixture

Tincture of Capsicum, *one hundred milliliters*	100 mils
Tincture of Rhubarb, *one hundred milliliters*	100 mils
Tincture of Opium, *two hundred milliliters*	200 mils
Spirit of Camphor, *two hundred milliliters*	200 mils
Spirit of Peppermint, *two hundred milliliters*	200 mils
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix them.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

MISTURA OPII ET SASSAFRAS

Mixture of Opium and Sassafras

Mist. Opii et Sassaf.

Mistura Sassafras et Opii, N.F. III Mistura Opii Alkalina Godfrey's Cordial

Tincture of Opium, *thirty-five milliliters*	35 mils
Oil of Sassafras, *one milliliter*	1 mil
Alcohol, *fifty milliliters*	50 mils
Potassium Carbonate, *eight grammes*	8 Gm.
Syrup, *three hundred and twenty-five milliliters*	325 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the tincture of opium with the alcohol containing the oil of sassafras. Dissolve the potassium carbonate in *five hundred milliliters* of water, mix this with the syrup, then add the mixture first prepared, and, lastly, sufficient water to make the product measure *one thousand milliliters*. Allow the mixture to stand during twenty-four hours and then filter.

AVERAGE DOSE—Infants, Metric, 0.3 mil—Apothecaries, 5 minims.

MISTURA PECTORALIS, STOKES

Stokes' Expectorant

Mist. Pect. Stokes

Ammonium Carbonate, *seventeen and five-tenths grammes*	17.5 Gm.
Fluidextract of Senega, *thirty-five milliliters*	35.0 mils
Fluidextract of Squill, *thirty-five milliliters*	35.0 mils
Camphorated Tincture of Opium, *one hundred and seventy-five milliliters*	175.0 mils
Water, *eighty-five milliliters*	85.0 mils
Syrup of Tolu, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the fluidextract of squill with the fluidextract of senega, the camphorated tincture of opium, and the ammonium carbonate, previously dissolved in the water; then add sufficient syrup of tolu to make the product measure *one thousand milliliters*.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

MISTURA RHEI ALKALINA

Alkaline Mixture of Rhubarb

Mist. Rhei Alk.

Syrupus Rhei et Potassii Compositus, N.F. III — Neutralizing Cordial

Fluidextract of Rhubarb, *sixteen milliliters*	16 mils
Fluidextract of Hydrastis, *eight milliliters*	8 mils
Potassium Carbonate, *sixteen grammes*	16 Gm.
Tincture of Cinnamon, *sixty-four milliliters*	64 mils
Spirit of Peppermint, *eight milliliters*	8 mils
Syrup, *two hundred and fifty milliliters*	250 mils
Diluted Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the potassium carbonate in the syrup, and add the solution to the fluidextracts, tincture and spirit, previously mixed with *five hundred milliliters* of diluted alcohol. Mix well, add sufficient diluted alcohol to make the product measure *one thousand milliliters*, and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

MISTURA RHEI COMPOSITA

Compound Mixture of Rhubarb

(U.S.P. VIII)

Mist. Rhei Co.

Mistura Rhei et Sodæ, U.S.P. VIII — Mixture of Rhubarb and Soda

Fluidextract of Rhubarb, *fifteen milliliters*	15 mils
Fluidextract of Ipecac, *three milliliters*	3 mils
Sodium Bicarbonate, *thirty-five grammes*	35 Gm.
Glycerin, *three hundred and fifty milliliters*	350 mils
Spirit of Peppermint, *thirty-five milliliters*	35 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the sodium bicarbonate in about *four hundred milliliters* of water. Add the fluidextracts, the glycerin, and the spirit of peppermint, and, lastly, sufficient water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

MUCILAGO CHONDRI

Mucilage of Chondrus

Mucil. Chondr. — Mucilage of Irish Moss

Chondrus, *thirty grammes*	30 Gm.
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Wash the chondrus with cold water, place it in a suitable vessel, add *one thousand milliliters* of water and heat it, on a water bath, during fifteen minutes, frequently stirring. Then strain it through muslin with pressure and pass sufficient water through the strainer to make the product, when cold, measure *one thousand milliliters.*

MUCILAGO SASSAFRAS MEDULLÆ

Mucilage of Sassafras Pith

(U.S.P. VIII)

Mucil. Sassaf. Medul.

Sassafras Pith, *two grammes*	**2 Gm.**
Water, *one hundred milliliters*	**100 mils**
To make about *one hundred milliliters*	**100 mils**

Macerate the sassafras pith in the water during three hours, and strain without expression.

This preparation should not be dispensed unless it has been recently prepared.

AVERAGE DOSE—Metric, 15 mils—Apothecaries, 4 fluidrachms.

MULLÆ

Mulls

Salve Mulls Steatins

Mulls are ointments of high fusing points, containing the desired medicinal agent, and spread on soft muslin or "mull," in a manner similar to the ordinary spread plasters. Although these mulls are more conveniently produced with the aid of special mechanical appliances, it is quite practicable to prepare them on a limited scale as follows:

Spread a sheet of moistened parchment paper on a smooth surface, wipe off the excess of moisture with a cloth, evenly stretch a corresponding piece of unsized mull upon the parchment paper and hold it in place with thumb-tacks. Then spread the previously melted and partly cooled ointment evenly on the mull by means of a broad, flat bristle-brush, and, when a sufficient layer has been applied in this way, smooth the surface by the aid of two elastic spatulas, heated by immersion in hot water, wiped dry, and used alternately to expedite the operation. A smooth surface having been produced, remove the thumb-tacks and withdraw the mull from the parchment paper, the operation being facilitated by fastening the uncoated end of the mull upon a flat stick of wood. Then suspend the mull on a string in a cool room, and when thoroughly chilled, cover it with paraffin paper and roll it into a cylinder.

The most suitable base for preparing Mulls is a mixture of suet and lard, in suitable proportions, with the occasional addition of wax or lead plaster—this depending upon the nature of the medicinal component, or the intended use. The following formulas may serve as examples.

MULLA ACIDI SALICYLICI

Salicylic Acid Mull

Mull. Ac. Salicyl. Unguentum Salicylatum Extensum, N.F. III

Salicylic Acid, *ten grammes*	10 Gm.
Benzoinated Suet, *eighty grammes*	80 Gm.
Benzoinated Lard, *ten grammes*	10 Gm.
To make *one hundred grammes*	100 Gm.

Mix the salicylic acid intimately with the benzoinated lard and then incorporate the benzoinated suet. Spread the mull as needed.

MULLA CREOSOTI SALICYLATA

Salicylated Creosote Mull

Mull. Creosot. Salicyl. Unguentum Creosoti Salicylatum Extensum, N.F. III

Salicylic Acid, *ten grammes*	10 Gm.
Creosote, *twenty grammes*	20 Gm.
Yellow Wax, *five grammes*	5 Gm.
Benzoinated Suet, *sixty-five grammes*	65 Gm.
To make *one hundred grammes*	100 Gm.

Melt the yellow wax, add the benzoinated suet, and then incorporate the creosote and salicylic acid, and stir until the product congeals. Spread the mull as needed.

MULLA HYDRARGYRI CHLORIDI CORROSIVI

Corrosive Mercuric Chloride Mull

Mull. Hydrarg. Chlor. Corros.

Unguentum Hydrargyri Chloridi Corrosivi Extensum, N.F. III

Corrosive Mercuric Chloride, *two grammes*	2 Gm.
Alcohol, *sixty milliliters*	60 mils
Benzoinated Suet, *nine hundred grammes*	900 Gm.
Benzoinated Lard, *fifty grammes*	50 Gm.
To make *one thousand grammes*	1000 Gm.

Dissolve the corrosive mercuric chloride in the alcohol, incorporate this with the benzoinated lard, and then incorporate the benzoinated suet. Avoid contact with metallic implements or containers. Spread the mull as needed.

MULLA ZINCI

Zinc Mull

Mull. Zinc. Unguentum Zinci Extensum, N.F. III

Zinc Oxide, *ten grammes*	10 Gm.
Benzoinated Suet, *seventy grammes*	70 Gm.
Benzoinated Lard, *twenty grammes*	20 Gm.
To make *one hundred grammes*	100 Gm.

Mix the zinc oxide intimately with the benzoinated lard and then incorporate the benzoinated suet. Spread the mull as needed.

NEBULA AROMATICA

Aromatic Oil Spray

Nebul. Arom. Aromatol

Phenol, *two-tenths of a gramme*	0.2 Gm.
Menthol, *two-tenths of a gramme*	0.2 Gm.
Thymol, *one-tenth of a gramme*	0.1 Gm.
Camphor, *three-tenths of a gramme*	0.3 Gm.
Benzoic Acid, *three-tenths of a gramme*	0.3 Gm.
Eucalyptol, *two-tenths of a milliliter*	0.2 mil
Oil of Cinnamon, *two-tenths of a milliliter*	0.2 mil
Oil of Clove, *two-tenths of a milliliter*	0.2 mil
Methyl Salicylate, *five-tenths of a milliliter*	0.5 mil
Light Liquid Petrolatum, *a sufficient quantity,*	
To make *one hundred milliliters*	100 mils

Mix the phenol, menthol, thymol and camphor in a flask and warm on a water bath until liquefied, then add the aromatic oils, eucalyptol, methyl salicylate, and benzoic acid and thoroughly mix with sufficient light liquid petrolatum to make the product measure *one hundred milliliters.* Filter if necessary.

NEBULA EUCALYPTOLIS

Eucalyptol Spray

Nebul. Eucalyptol.

Eucalyptol, *five milliliters*	5 mils
Light Liquid Petrolatum, *ninety-five milliliters*	95 mils
To make *one hundred milliliters*	100 mils

Mix them.

NEBULA MENTHOLIS

Menthol Spray

Nebul. Menthol.

Menthol, *two grammes*	2 Gm.
Light Liquid Petrolatum, *a sufficient quantity,*	
To make *one hundred milliliters*	100 mils

Dissolve the menthol in the light liquid petrolatum which has been warmed to about 70° C., and filter if necessary.

NEBULA MENTHOLIS COMPOSITA

Compound Menthol Spray

Nebul. Menthol. Co.

Menthol, *one gramme*	1.0 Gm.
Camphor, *one gramme*	1.0 Gm.
Methyl Salicylate, *five-tenths of a milliliter*	0.5 mil
Eucalyptol, *two-tenths of a milliliter*	0.2 mil
Oil of Cinnamon, *two-tenths of a milliliter*	0.2 mil
Light Liquid Petrolatum, *a sufficient quantity,*	
To make *one hundred milliliters*	100 mils

Triturate the menthol, camphor, eucalyptol, methyl salicylate and oil together in a dry mortar, add *seventy-five milliliters* of light liquid petrolatum and continue trituration until solution is effected. Finally add sufficient light liquid petrolatum to make the product measure *one hundred milliliters,* and filter if necessary.

NEBULA THYMOLIS

Thymol Spray

Nebul. Thymol.

Thymol, *one gramme*	1 Gm.
Light Liquid Petrolatum, *a sufficient quantity,*	
To make *one hundred milliliters*	100 mils

Dissolve the thymol in the light liquid petrolatum.

OLEA INFUSA

Infused Oils

Ol. Inf.

The Air Dried Drug, in No. 30 powder, *one hundred grammes.*	100 Gm.
Alcohol, *one hundred milliliters*	100 mils
Ammonia Water, *two milliliters*	2 mils
Sesame Oil, *one thousand grammes*	1000 Gm.
To make about *one thousand grammes* . .	1000 Gm.

Moisten the drug with the alcohol and ammonia water, previously mixed, macerate for six hours in a covered vessel, and then add the sesame oil. Warm this mixture on a water bath, at a temperature between 60° and 70° C., in an open vessel, frequently stirring, until the alcohol and ammonia water are dissipated. Then transfer the mixture to a strainer, express the residue and filter the strained Oil.

Preserve Infused Oils in small, amber-colored bottles in a cool place.

OLEATUM ACONITINÆ

Oleate of Aconitine

Oleat. Aconitin.

Aconitine, *two grammes*	2 Gm.
Oleic Acid, *fifty grammes*	50 Gm.
Olive Oil, *a sufficient quantity,*	
To make *one hundred grammes*	100 Gm.

Triturate the aconitine with a small portion of the oleic acid in a mortar, then incorporate the remainder of the oleic acid and stir the mixture frequently until the alkaloid is dissolved; finally add sufficient olive oil to make the product weigh *one hundred grammes.*

CAUTION—Oleate of Aconitine should never be applied with the unprotected hand or fingers; use a brush or small swab.

OLEATUM ATROPINÆ

Oleate of Atropine

(U.S.P. VIII)

Oleat. Atrop.

Atropine, *two grammes*	2 Gm.
Alcohol, *two milliliters*	2 mils
Oleic Acid, *fifty grammes*	50 Gm.
Olive Oil, *a sufficient quantity,*	
To make *one hundred grammes*	100 Gm.

Triturate the atropine in a tared mortar with the alcohol, then add about an equal volume of the oleic acid, and, after warming the mortar, stir until the alcohol has evaporated. Now add the remainder of the oleic acid, and continue stirring until the atropine is dissolved. Finally add sufficient olive oil to make the product weigh *one hundred grammes.*

OLEATUM COCAINÆ

Oleate of Cocaine

(U.S.P. VIII)

Oleat. Cocain.

Cocaine, *five grammes*	**5 Gm.**
Alcohol, *five milliliters*	**5 mils**
Oleic Acid, *fifty grammes*	**50 Gm.**
Olive Oil, *a sufficient quantity,*	
To make *one hundred grammes*	**100 Gm.**

Triturate the cocaine in a tared mortar with the alcohol, then add about an equal volume of the oleic acid, and, after warming the mortar, stir until the alcohol has evaporated. Now add the remainder of the oleic acid, and continue stirring until the cocaine is dissolved. Finally add sufficient olive oil to make the product weigh *one hundred grammes.*

OLEATUM QUININÆ

Oleate of Quinine

(U.S.P. VIII)

Oleat. Quin.

Quinine, *twenty-five grammes*	**25 Gm.**
Oleic Acid, *seventy-five grammes*	**75 Gm.**
To make *one hundred grammes*	**100 Gm.**

Triturate the quinine in a warm mortar with a small quantity of the oleic acid to a smooth paste. Then add the remainder of the oleic acid, previously warmed, and stir frequently until the quinine is dissolved.

OLEATUM VERATRINÆ

Oleate of Veratrine

(U.S.P. VIII)

Oleat. Veratrin.

Veratrine, *two grammes*	**2 Gm.**
Oleic Acid, *fifty grammes*	**50 Gm.**
Olive Oil, *a sufficient quantity,*	
To make *one hundred grammes*	**100 Gm.**

Triturate the veratrine in a tared mortar with about *five milliliters* of olive oil, and, after warming the mortar, add the oleic acid, and continue stirring until the veratrine is dissolved; finally add sufficient olive oil to make the product weigh *one hundred grammes.*

OLEORESINA LUPULINI

Oleoresin of Lupulin

(U.S.P. VIII)

Oleores. Lupulin.

Lupulin, *five hundred grammes* . . . . . **500 Gm.**
Ether, *a sufficient quantity.*

Introduce the lupulin into a cylindrical glass percolator, provided with a stop-cock, and arranged with a cover and a receptacle suitable for volatile liquids. Press the powder very lightly, and percolate slowly with ether, added in successive portions, until the lupulin is practically exhausted. Recover the greater part of the ether from the percolate by distillation on a water bath, and, having transferred the residue to a dish, allow the remaining ether to evaporate spontaneously in a warm place. Preserve the oleoresin in a well-stoppered bottle.

AVERAGE DOSE—Metric, 0.2 mil—Apothecaries, 3 grains.

OLEOSACCHARA

Oil-Sugars

Elæosacchara

The Prescribed Volatile Oil, *two milliliters* . . . . . **2 mils**
Sugar, in fine powder, *one hundred grammes* . . . . . **100 Gm.**

Triturate the sugar with the volatile oil until a homogeneous mixture is obtained.

OLEUM ÆTHEREUM

Ethereal Oil

(U.S.P. VIII)

Ol. Æther.

A volatile liquid consisting of equal volumes of heavy oil of wine and ether.

Alcohol, *one thousand milliliters* . . . . . **1000 mils**
Sulphuric Acid, *one thousand milliliters* . . . . . **1000 mils**
Distilled Water, *twenty-five milliliters* . . . . . **25 mils**
Ether, *a sufficient quantity.*

Add the sulphuric acid slowly to the alcohol, mix them thoroughly, and allow the mixture to stand, in a closed flask, for twenty-four hours, or until the liquid is clear; then pour the clear liquid into a tubulated retort of such capacity that the mixture shall nearly fill it. Insert a thermometer through the tubulure, so that the bulb shall be deeply immersed in the liquid, and, having connected the retort with a well-cooled condenser, and also having connected a bent glass tube with the receiver for conducting the uncondensed gases into water, distil, by means of a sand bath, at a temperature between 150° and 160° C., until oily drops cease to come over, or until a black froth, which forms on the surface, begins to rise in the retort. Separate the yellow, ethereal liquid from the distillate, and expose it to the air for twenty-four hours, in a shallow dish. Then transfer it to a wet filter, and, when the aqueous portion has drained off, wash the oil which is left on the filter with the distilled water, which must be as cold as possible. When this also has drained off, transfer the oil to a graduated measure, and add to it an equal volume of ether.

Preserve the product in small, glass-stoppered bottles, in a cool place.

A transparent, nearly colorless, volatile liquid, of a peculiar, aromatic, ethereal odor, and a pungent, refreshing, bitter taste; neutral to dry litmus paper.
Specific gravity: about 0.905 at 25° C.

OLEUM HYOSCYAMI COMPOSITUM

Compound Oil of Hyoscyamus

Ol. Hyosc. Co. Balsamum Tranquillans

Oil of Lavender, *two milliliters*	**2 mils**
Oil of Peppermint, *two milliliters*	**2 mils**
Oil of Rosemary, *two milliliters*	**2 mils**
Oil of Thyme, *two milliliters*	**2 mils**
Infused Oil of Hyoscyamus (prepared by the general formula on page 151), *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix them.

OLEUM PHENOLATUM

Phenolated Oil

Ol. Phenol. Oleum Carbolatum, N.F. III Carbolized Oil

Phenol, *five grammes*	**5 Gm.**
Olive Oil, *ninety-five grammes*	**95 Gm.**
To make *one hundred grammes*	**100 Gm.**

Melt the phenol with a gentle heat, and mix it with the olive oil.

OLEUM PHOSPHORATUM

Phosphorated Oil

Ol. Phosphorat.

Phosphorus, *one gramme*	**1 Gm.**
Expressed Oil of Almond,	
Ether, each, *a sufficient quantity,*	
To make *one hundred grammes*	**100 Gm.**

Pour a sufficient quantity of expressed oil of almond into a flask, heat it on a sand bath to 250° C. and keep it at that temperature for fifteen minutes. Then allow it to cool, and filter it. Introduce *ninety grammes* of the filtered oil together with the phosphorus, previously well dried, into a dry, tared bottle of about *one hundred and twenty milliliters* capacity, insert the stopper and heat the bottle in a water bath until the phosphorus melts. Then agitate it until the phosphorus is dissolved, allow the oil to cool before opening the bottle, add enough ether to make the mixture weigh *one hundred grammes*, and agitate it again. Lastly, transfer the solution to small, glass-stoppered bottles, which should be completely filled and kept in a cool, dark place.

A clear, yellowish liquid, having the odor of phosphorus and of ether, and free from undissolved particles.

AVERAGE DOSE—Metric, 0.05 mil—Apothecaries, 1 minim.

OLEUM RICINI AROMATICUM

Aromatic Castor Oil

Ol. Ricin. Arom.

Benzosulphinide, *five-tenths of a gramme*	**0.5 Gm.**
Oil of Cinnamon, *three milliliters*	**3.0 mils**
Oil of Clove, *one milliliter*	**1.0 mil**
Vanillin, *one gramme*	**1.0 Gm.**
Coumarin, *one-tenth of a gramme*	**0.1 Gm.**
Alcohol, *thirty milliliters*	**30.0 mils**
Castor Oil, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the volatile oils and the solids in the alcohol, add the castor oil and mix thoroughly.

AVERAGE DOSE—Metric, 15 mils—Apothecaries, 4 fluidrachms.

OXYMEL SCILLÆ

Oxymel of Squill

Oxymel Scill.

Vinegar of Squill, *fifty grammes*	**50 Gm.**
Clarified Honey, *one hundred grammes*	**100 Gm.**
To make *one hundred grammes*	**100 Gm.**

Mix the honey and the vinegar of squill in a tared porcelain dish or enameled iron vessel, and heat on a water bath until the mixture has been reduced to a weight of *one hundred grammes.* Then strain the preparation, allow it to cool, and transfer it to bottles, which should be well stoppered.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

PASTÆ DERMATOLOGICÆ

Dermatologic Pastes

Dermatologic Pastes are medicaments for external use, employed in the practice of dermatologists. They are ointment-like mixtures of starch, dextrin, zinc oxide, sulphur, calcium carbonate or other medicinal substances made into a paste with glycerin, soft soap, petrolatum, lard or other fats, medicated with antiseptic or astringent agents. The formulas which follow serve as examples.

PASTA BETANAPHTHOLIS

Betanaphthol Paste

Past. Betanaphthol.

Pasta Naphtholis, Lassar, N.F. III — Lassar's Naphthol Paste

Betanaphthol, in very fine powder, *ten grammes*	**10 Gm.**
Precipitated Sulphur, *fifty grammes*	**50 Gm.**
Petrolatum, *twenty grammes*	**20 Gm.**
Soft Soap, *twenty grammes*	**20 Gm.**
To make *one hundred grammes*	**100 Gm.**

Triturate the betanaphthol and sulphur with the petrolatum and then incorporate the soft soap with the mixture.

PASTA DEXTRINATA

Dextrinated Paste

Past. Dextrin.

White Dextrin, *thirty-three grammes*	**33 Gm.**
Glycerin, *thirty-three grammes*	**33 Gm.**
Water, *a sufficient quantity,*	
To make *one hundred grammes*	**100 Gm.**

Dissolve the dextrin in the glycerin and *thirty-three milliliters* of water, in a tared dish with the aid of heat, and add sufficient water to make the product weigh *one hundred grammes.*

PASTA RESORCINOLIS FORTIS

Strong Resorcinol Paste

Past. Resorcin. Fort. Lassar's Stronger Resorcinol Paste

Resorcinol, *twenty grammes*	**20 Gm.**
Zinc Oxide, *twenty grammes*	**20 Gm.**
Starch, *twenty grammes*	**20 Gm.**
Light Liquid Petrolatum, *forty grammes*	**40 Gm.**
To make *one hundred grammes*	**100 Gm.**

Thoroughly triturate the zinc oxide with sufficient of the liquid petrolatum to make a thin, smooth paste. Reduce the resorcinol to a very fine powder, mix it with the starch, add the mixture to the zinc oxide paste and triturate until a uniformly smooth product is obtained. Then gradually incorporate the remainder of the liquid petrolatum.

PASTA RESORCINOLIS MITIS

Mild Resorcinol Paste

Past. Resorcin. Mit.

Pasta Resorcini Mitis, Lassar, N.F. III Lassar's Mild Resorcinol Paste

Resorcinol, *ten grammes*	**10 Gm.**
Zinc Oxide, *twenty-five grammes*	**25 Gm.**
Starch, *twenty-five grammes*	**25 Gm.**
Light Liquid Petrolatum, *forty grammes*	**40 Gm.**
To make *one hundred grammes*	**100 Gm.**

Thoroughly triturate the zinc oxide with sufficient of the liquid petrolatum to make a thin, smooth paste. Reduce the resorcinol to a very fine powder, mix it with the starch, add the mixture to the zinc oxide paste and triturate until a uniformly smooth product is obtained. Then gradually incorporate the remainder of the liquid petrolatum.

PASTA ZINCI

Zinc Paste

Past. Zinc. Pasta Zinci, Lassar, N.F. III Lassar's Zinc Paste

Salicylic Acid, in fine powder, *two grammes*	**2 Gm.**
Zinc Oxide, *twenty-four grammes*	**24 Gm.**
Starch, *twenty-four grammes*	**24 Gm.**
Petrolatum, *fifty grammes*	**50 Gm.**
To make *one hundred grammes*	**100 Gm.**

Thoroughly triturate the zinc oxide with a portion of the petrolatum; then add the salicylic acid, starch, and the remaining petrolatum, and rub them until a perfectly smooth mixture is obtained.

PASTA ZINCI MOLLIS

Soft Zinc Paste

Past. Zinc. Moll.

Pasta Zinci Mollis, Unna, N.F. III Unna's Soft Zinc Paste

Zinc Oxide, *twenty-five grammes*	**25 Gm.**
Precipitated Calcium Carbonate, *twenty-five grammes*	**25 Gm.**
Linseed Oil, *twenty-five grammes*	**25 Gm.**
Solution of Calcium Hydroxide, *twenty-five grammes*	**25 Gm.**
To make *one hundred grammes*	**100 Gm.**

Thoroughly triturate the zinc oxide and the precipitated calcium carbonate with the linseed oil, gradually added, so as to form a perfectly smooth mixture, and then incorporate the solution of calcium hydroxide.

PASTA ZINCI SULPHURATA

Sulphurated Zinc Paste

Past. Zinc. Sulphur.

Pasta Zinci Sulphurata, Unna, N.F. III Unna's Sulphurated Zinc Paste

Zinc Oxide, *fifteen grammes*	**15 Gm.**
Precipitated Sulphur, *ten grammes*	**10 Gm.**

Purified Siliceous Earth, *five grammes*	**5 Gm.**
Benzoinated Lard, *seventy grammes*	**70 Gm.**
To make *one hundred grammes*	**100 Gm.**

Mix the powders and triturate them with about an equal weight of benzoinated lard until a smooth mixture is obtained. Then incorporate the remainder of the benzoinated lard.

PEPSINUM SACCHARATUM

Saccharated Pepsin

Pepsin. Sacchar.

Pepsin, *ten grammes*	**10 Gm.**
Sugar of Milk, recently dried and in fine powder, *ninety grammes*	**90 Gm.**
To make *one hundred grammes*	**100 Gm.**

Triturate the pepsin with the sugar of milk to a uniform, fine powder. Keep the product in well-stoppered bottles.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

PETROXOLINUM BETANAPHTHOLIS

Betanaphthol Petroxolin

Petrox. Betanaphthol. Betanaphthol Petrox

Betanaphthol, in fine powder, *ten grammes*	**10 Gm.**
Liquid Petroxolin, *ninety grammes*	**90 Gm.**
To make *one hundred grammes*	**100 Gm.**

Dissolve the betanaphthol in the liquid petroxolin by agitation.

This preparation should not be dispensed unless it has been recently prepared.

PETROXOLINUM CADINUM

Cade Petroxolin

Petrox. Cadin. Cade Petrox

Oil of Cade, *twenty-five grammes*	**25 Gm.**
Liquid Petroxolin, *seventy-five grammes*	**75 Gm.**
To make *one hundred grammes*	**100 Gm.**

Mix them.

PETROXOLINUM CHLOROFORMI CAMPHORATUM

Camphorated Chloroform Petroxolin

Petrox. Chlorof. Camph. Camphor and Chloroform Petrox

Chloroform, *twenty-five grammes*	**25 Gm.**
Camphor, *twenty-five grammes*	**25 Gm.**
Liquid Petroxolin, *fifty grammes*	**50 Gm.**
To make *one hundred grammes*	**100 Gm.**

Dissolve the camphor in the chloroform and add the liquid petroxolin.

PETROXOLINUM CREOSOTI

Creosote Petroxolin

Petrox. Creosot. Creosote Petrox

Creosote, *twenty grammes*	**20 Gm.**
Oleic Acid, *five grammes*	**5 Gm.**
Liquid Petroxolin, *seventy-five grammes*	**75 Gm.**
To make *one hundred grammes*	**100 Gm.**

Mix them.

PETROXOLINUM EUCALYPTOLIS

Eucalyptol Petroxolin

Petrox. Eucalyptol. Eucalyptol Petrox

Eucalyptol, *twenty grammes*	**20 Gm.**
Liquid Petroxolin, *eighty grammes*	**80 Gm.**
To make *one hundred grammes*	**100 Gm.**

Mix them.

PETROXOLINUM GUAIACOLIS

Guaiacol Petroxolin

Petrox. Guaiacol. Guaiacol Petrox

Guaiacol, *twenty grammes*	**20 Gm.**
Oleic Acid, *five grammes*	**5 Gm.**
Liquid Petroxolin, *seventy-five grammes*	**75 Gm.**
To make *one hundred grammes*	**100 Gm.**

Mix them.

PETROXOLINUM HYDRARGYRI

Mercury Petroxolin

Petrox. Hydrarg.	Mercury Petrox
Mercury, *thirty grammes*	30 Gm.
Hydrous Wool Fat, *thirteen grammes*	13 Gm.
Oleic Acid, *two grammes*	2 Gm.
Solid Petroxolin, *fifty-five grammes*	55 Gm.
To make *one hundred grammes*	100 Gm.

Triturate the mercury with the mixture of hydrous wool fat and oleic acid until it is distributed and globules are no longer visible when examined with a lens magnifying ten diameters; then add the solid petroxolin and mix thoroughly.

PETROXOLINUM IODI

Iodine Petroxolin

Petrox. Iod.	Iodine Petrox, 10 per cent.
Iodine, *ten grammes*	10 Gm.
Oleic Acid, *forty grammes*	40 Gm.
Alcohol, *twenty grammes*	20 Gm.
Light Liquid Petrolatum, *twenty-three grammes*	23 Gm.
Oil of Lavender, *two grammes*	2 Gm.
Stronger Ammonia Water, *five grammes*	5 Gm.
To make *one hundred grammes*	100 Gm.

Reduce the iodine to a coarse powder by trituration in a glass mortar, transfer it to a suitable flask with the aid of the alcohol, add the oleic acid and agitate the contents of the flask until the iodine is dissolved. Then add the oil of lavender and the liquid petrolatum, mix the liquids, and finally introduce the stronger ammonia water and shake the mixture until a clear solution results.

PETROXOLINUM IODI DILUTUM

Diluted Iodine Petroxolin

Petrox. Iod. Dil.	Iodine Petrox, 5 per cent.
Iodine, in coarse powder, *five grammes*	5 Gm.
Liquid Petroxolin, *ninety-five grammes*	95 Gm.
To make *one hundred grammes*	100 Gm.

Dissolve the iodine by agitation with the liquid petroxolin in a stoppered bottle.

PETROXOLINUM IODOFORMI

Iodoform Petroxolin

Petrox. Iodoform.	Iodoform Petrox
Iodoform, *three grammes*	3 Gm.
Acetone, *twenty grammes*	20 Gm.
Oleic Acid, *ten grammes*	10 Gm.
Eucalyptol, *three grammes*	3 Gm.
Liquid Petroxolin, *sixty-four grammes*	64 Gm.
To make *one hundred grammes*	100 Gm.

Dissolve the iodoform in the acetone, add the eucalyptol, the oleic acid and the liquid petroxolin, and mix the ingredients thoroughly.

This preparation should not be dispensed unless it has been recently prepared.

PETROXOLINUM LIQUIDUM

Liquid Petroxolin

Petrox. Liq.

Petrolatum Saponatum Liquidum, N.F. III	Liquid Petrox
Light Liquid Petrolatum, *fifty grammes*	50 Gm.
Oleic Acid, *twenty-eight grammes*	28 Gm.
Oil of Lavender, *two grammes*	2 Gm.
Stronger Ammonia Water, *five grammes*	5 Gm.
Alcohol, *fifteen grammes*	15 Gm.
To make *one hundred grammes*	100 Gm.

Mix the liquid petrolatum and oleic acid in a flask, add the alcohol and then the stronger ammonia water, and warm the mixture on a water bath, with frequent agitation, until it becomes clear. Lastly add the oil of lavender and mix thoroughly.

A yellowish-brown liquid, miscible with ether, chloroform, petroleum benzin or acetone and producing an emulsion-like mixture when added to twice its volume of water.

PETROXOLINUM MENTHOLIS

Menthol Petroxolin

Petrox. Menthol.	Menthol Petrox
Menthol, *seventeen grammes*	17 Gm.
Liquid Petroxolin, *eighty-three grammes*	83 Gm.
To make *one hundred grammes*	100 Gm.

Dissolve the menthol in the liquid petroxolin by agitation.

PETROXOLINUM METHYLIS SALICYLATIS

Methyl Salicylate Petroxolin

Petrox. Methyl. Sal.	Methyl Salicylate Petrox
Methyl Salicylate, *twenty grammes*	20 Gm.
Liquid Petroxolin, *eighty grammes*	80 Gm.
To make *one hundred grammes*	100 Gm.

Mix them.

PETROXOLINUM PHENOLIS

Phenol Petroxolin

Petrox. Phenol.	Phenol Petrox
Phenol, *five grammes*	5 Gm.
Liquid Petroxolin, *ninety-five grammes*	95 Gm.
To make *one hundred grammes*	100 Gm.

Dissolve the phenol in the liquid petroxolin by agitation.

PETROXOLINUM PHENOLIS CAMPHORATUM

Camphorated Phenol Petroxolin

Petrox. Phenol. Camph.	Camphorated Phenol Petrox
Phenol, *twelve and five-tenths grammes*	12.5 Gm.
Camphor, in powder, *thirty-seven and five-tenths grammes*	37.5 Gm.
Liquid Petroxolin, *fifty grammes*	50.0 Gm.
To make *one hundred grammes*	100 Gm.

Mix the camphor and phenol, and when the mixture has liquefied add the liquid petroxolin, and mix them thoroughly.

PETROXOLINUM PICIS

Tar Petroxolin

Petrox. Pic.	Tar Petrox
Rectified Oil of Tar, *twenty-five grammes*	25 Gm.
Liquid Petroxolin, *seventy-five grammes*	75 Gm.
To make *one hundred grammes*	100 Gm.

Mix them.

PETROXOLINUM SPISSUM

Solid Petroxolin

Petrox. Spiss.

Petrolatum Saponatum Spissum, N.F. III Solid Petrox

White Wax, *thirty-five grammes*	35 Gm.
Light Liquid Petrolatum, *twenty grammes*	20 Gm.
Oleic Acid, *thirty-two grammes*	32 Gm.
Oil of Lavender, *three grammes*	3 Gm.
Alcohol, *five grammes*	5 Gm.
Stronger Ammonia Water, *five grammes*	5 Gm.
To make *one hundred grammes*	100 Gm.

Melt the white wax with the liquid petrolatum on a water bath, add the oleic acid and transfer the mixture at once to a warm mortar; immediately add the mixed alcohol and stronger ammonia water and stir continuously until cool. Finally add the oil of lavender.

PETROXOLINUM SULPHURATUM

Sulphurated Petroxolin

Petrox. Sulphur. Sulphurated Petrox

Sublimed Sulphur, *three grammes*	3 Gm.
Linseed Oil, *thirty-seven grammes*	37 Gm.
Oleic Acid, *thirty grammes*	30 Gm.
Liquid Petroxolin, *a sufficient quantity,*	
To make *one hundred grammes*	100 Gm.

Heat the sublimed sulphur and linseed oil in a tared flask, on a sand bath, until the sulphur is dissolved, then allow the mixture to cool, add the oleic acid, and sufficient liquid petroxolin to make the product weigh *one hundred grammes.* Warm the mixture slightly, if necessary, to obtain a clear liquid.

PETROXOLINUM SULPHURATUM COMPOSITUM

Compound Sulphurated Petroxolin

Petrox. Sulphur. Co. Compound Sulphurated Petrox

Sulphurated Petroxolin, *ten grammes*	10.0 Gm.
Oil of Cade, *ten grammes*	10.0 Gm.
Thymol, *three-tenths of a gramme*	0.3 Gm.

Eucalyptol, *three grammes*	3.0 Gm.
Oil of Turpentine, *thirty grammes*	30.0 Gm.
Liquid Petroxolin, *a sufficient quantity,*	
To make *one hundred grammes*	100 Gm.

Mix the thymol and eucalyptol, add the oils, and when in solution add the sulphurated petroxolin, and finally sufficient liquid petroxolin to make the product weigh *one hundred grammes.*

PETROXOLINUM TEREBINTHINÆ LARICIS

Venice Turpentine Petroxolin

Petrox. Terebinth. Laric. Venice Turpentine Petrox

Venice Turpentine, *twenty grammes*	20 Gm.
Liquid Petroxolin, *eighty grammes*	80 Gm.
To make *one hundred grammes*	100 Gm.

Mix them.

PHENOL IODATUM

Iodized Phenol

Phenol. Iodat. Acidum Carbolicum Iodatum, N.F. III

Iodine, reduced to powder, *twenty grammes*	20 Gm.
Phenol, *sixty grammes*	60 Gm.
Glycerin, *twenty grammes*	20 Gm.
To make *one hundred grammes*	100 Gm.

Place the iodine in a flask, add the phenol, previously melted, then the glycerin, and digest the mixture at a gentle heat, frequently agitating, until the iodine is dissolved.

Preserve the product in glass-stoppered bottles in a dark place.

PILULÆ

Pills

Pills are globular or ovoid dosage forms of medicinal substances intended for administration by the mouth. Each pill weighs not less than 0.06 Gm., nor more than 0.5 Gm. If they weigh less than 0.06 Gm. and more than 0.02 Gm. each they are known as *"Granules"*; if the weight is less than 0.02 Gm., they are usually designated as *"Parvules."* The ingredients are massed by the aid of judiciously selected excipients.

The standard and popular formulas for pills are prepared in large quantities by the pharmaceutical manufacturers and many ingenious machines for their manufacture and coating have been devised.

When pills are compounded extemporaneously, it is customary to dispense them with sufficient dusting powder, consisting of an inert material such as lycopodium, glycyrrhiza, starch or talc, to keep them from adhering. At times, it is desirable to preserve stock pills, or to protect and preserve the constituents of the pills, or to mask their taste or odor by a coating. The usual intent is to have the pills disintegrate in the stomach, and for such a coating of gelatin, sugar, cocoa, tolu or silver is selected, as these readily dissolve or break down in the acid juices of the stomach. In some cases, however, the purpose is to have the pills retain their form until they reach the alkaline fluids of the intestines. Such pills are called "Enteric Pills," and for the coating of these salol is commonly employed.

For the extemporaneous coating of pills by the pharmacist the following methods are recommended:

a. Gelatin Coating.—Dip the pills, freed from dusting powder, into a warm solution of gelatin, remove the excess and allow the pills to dry.

b. Sugar Coating.—Quickly roll the pills, freed from dusting powder, on a filter paper saturated with mucilage of acacia, until uniformly but superficially moist, then immediately transfer them to a porcelain dish containing a mixture of eight parts of powdered sugar or sugar of milk and two parts of powdered acacia, and rapidly rotate them until covered with a firm white coating.

c. Cocoa Coating.—Quickly roll the pills, freed from dusting powder, on a filter paper saturated with mucilage of acacia, until uniformly but superficially moist, shake them at once with powdered cocoa until well coated, then immediately transfer them to a clean, warmed porcelain dish, and rapidly rotate them until a smooth coating is produced.

d. Tolu Coating.—Drop the pills, freed from dusting powder, into a porcelain dish in which a thin layer of equal volumes of tincture of tolu and ether has been previously placed, and rotate them until thoroughly coated with the mixture. Turn them at once into another dish of the same kind and size, and rotate for a few moments to remove the excess of mixture, and while the pills are still shining, but not too moist, transfer them to a third dish, previously coated with a very thin film of oil, which has been applied by the tips of the fingers, and rotate them until dry. A second or a third coating may be applied in the same manner, if necessary.

e. Silver Coating.—Drop the pills, preferably coated with tolu as described under *d*, into a porcelain mortar, in which a very thin layer of a mixture composed of equal parts of alcohol, syrup, mucilage of

acacia and water has been placed, and then rotate them until they have acquired a thin coat of this mixture. Then drop them into an ointment jar of suitable size, containing the requisite quantity of silver foil (determined by experience), and rapidly rotate the jar until the pills are thoroughly coated. This coating may be brightened, by transferring the pills to a second jar, containing a few leaves of silver foil, and shaking them until thoroughly polished.

Salol Coating.—Drop the pills, carefully freed from dusting powder, into an enameled or porcelain dish, preferably with a flat bottom and straight sides, containing enough phenyl salicylate (approximately 0.06 Gm. to every 0.12 Gm. pill), previously just melted by the heat of a water bath and allowed to cool so that on passing the hand along the bottom of the dish there is scarcely any warmth felt yet the salt remains completely melted. Start the dish to rotating before adding the pills and continue rotation until the pills are coated and the phenyl salicylate has congealed. Repeat this process twice, each time reducing the amount of phenyl salicylate about one-half. Finally, apply a finishing coat by using only sufficient phenyl salicylate to barely coat the dish when melted, repeating the operation as before.

PILULÆ AD PRANDIUM

Dinner Pills

Pil. Ad. Prand.

1. When "Dinner Pills," under this or some other equivalent name, are prescribed without further specification, it is recommended that the *Pilulæ Aloes et Mastiches*, also called Lady Webster's Dinner Pills, be dispensed. Other similar pills are:—

2. Chapman's Dinner Pills.

Aloes, in fine powder, *nine and seven-tenths grammes*	**9.7 Gm.**
Mastic, in fine powder, *nine and seven-tenths grammes*	**9.7 Gm.**
Ipecac, in fine powder, *six and five-tenths grammes*	**6.5 Gm.**
Oil of Fennel, *one and five-tenths milliliters*	**1.5 mils**
Diluted Alcohol, *a sufficient quantity,*	
To make *one hundred pills*	**100 pills**

Mix the ingredients intimately, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

3. Cole's Dinner Pills.

Aloes, in fine powder, *seven and eight-tenths grammes*	7.80 Gm.
Mass of Mercury, *seven and eight-tenths grammes*	7.80 Gm.
Jalap, in fine powder, *seven and eight-tenths grammes*	7.80 Gm.
Antimony and Potassium Tartrate, *thirteen hundredths of a gramme*	0.13 Gm.
Syrup, *a sufficient quantity,*	
To make *one hundred pills*	100 pills

Mix the ingredients intimately, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

4. Hall's Dinner Pills.

Aloes, in fine powder, *six and five-tenths grammes*	6.5 Gm.
Extract of Glycyrrhiza, *six and five-tenths grammes*	6.5 Gm.
Soap, in fine powder, *six and five-tenths grammes*	6.5 Gm.
Syrup, *a sufficient quantity,*	
To make *one hundred pills*	100 pills

Mix the ingredients intimately, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ ALOES ET ASAFŒTIDÆ

Pills of Aloes and Asafetida

Pil. Aloe. et Asafœt.

Aloes, in fine powder, *nine grammes*	9 Gm.
Asafetida, *nine grammes*	9 Gm.
Soap, *nine grammes*	9 Gm.
Water, *a sufficient quantity,*	
To make *one hundred pills*	100 pills

Mix the ingredients intimately, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ ALOES ET FERRI

Pills of Aloes and Iron

(U.S.P. VIII)

Pil. Aloe. et Ferr.

Aloes, in fine powder, *seven grammes*	**7 Gm.**
Exsiccated Ferrous Sulphate, *seven grammes*	**7 Gm.**
Aromatic Powder, *seven grammes*	**7 Gm.**
Confection of Rose, *a sufficient quantity,*	
To make *one hundred pills*	**100 pills**

Mix the powders intimately, then incorporate sufficient confection of rose to form a mass, and divide it into *one hundred pills.*

AVERAGE DOSE—2 pills.

PILULÆ ALOES ET MASTICHES

Pills of Aloes and Mastic

(U.S.P. VIII)

Pil. Aloe. et Mastich. Lady Webster's Dinner Pills

Aloes, in fine powder, *thirteen grammes*	**13 Gm.**
Mastic, in fine powder, *four grammes*	**4 Gm.**
Red Rose, in fine powder, *three grammes*	**3 Gm.**
Diluted Alcohol, *a sufficient quantity,*	
To make *one hundred pills*	**100 pills**

Mix the powders intimately, then incorporate sufficient diluted alcohol to form a mass, and divide it into *one hundred pills.*

AVERAGE DOSE—2 pills.

PILULÆ ALOES ET MYRRHÆ

Pills of Aloes and Myrrh

(U.S.P. VIII)

Pil. Aloe. et Myrrh.

Aloes, in fine powder, *thirteen grammes*	**13 Gm.**
Myrrh, in fine powder, *six grammes*	**6 Gm.**
Aromatic Powder, *four grammes*	**4 Gm.**
Syrup, *a sufficient quantity,*	
To make *one hundred pills*	**100 pills**

Mix the powders intimately, then incorporate sufficient syrup to form a mass, and divide it into *one hundred pills.*

AVERAGE DOSE—2 pills.

PILULÆ ALOES ET PODOPHYLLI COMPOSITÆ

Compound Pills of Aloes and Podophyllum

Pil. Aloe. et Podoph. Co. Janeway's Pills

Aloes, *six and five-tenths grammes*	**6.50 Gm.**
Resin of Podophyllum, *three and twenty-five hundredths grammes*	**3.25 Gm.**
Pilular Extract of Belladonna Leaves, *one and six-tenths grammes*	**1.60 Gm.**
Extract of Nux Vomica, *one and six-tenths grammes*	**1.60 Gm.**
To make *one hundred pills*	**100 pills**

Uniformly mix the several ingredients, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ ALOES, HYDRARGYRI ET PODOPHYLLI

Pills of Aloes, Mercury and Podophyllum

Pil. Aloe. Hydrarg. et Podoph.

Pilulæ Triplices, N.F. III Triplex Pills Pilula Triplex

Aloes, *thirteen grammes*	**13.0 Gm.**
Mass of Mercury, *six and five-tenths grammes*	**6.5 Gm.**
Resin of Podophyllum, *one and six-tenths grammes*	**1.6 Gm.**
To make *one hundred pills*	**100 pills**

Uniformly mix the several ingredients, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ ALOES, HYDRARGYRI ET SCAMMONII COMPOSITÆ

Compound Pills of Aloes, Mercury and Scammony

Pil. Aloe. Hydrarg. et Scammon. Francis' "Triplex" Pills

Aloes, *five and five-tenths grammes*	**5.50 Gm.**
Resin of Scammony, *five and five-tenths grammes*	**5.50 Gm.**
Mass of Mercury, *five and five-tenths grammes*	**5.50 Gm.**
Croton Oil, *thirty-two hundredths of a milliliter*	**0.32 mil**
Oil of Caraway, *one and six-tenths milliliters*	**1.60 mils**
Tincture of Aloes and Myrrh, *a sufficient quantity,*	
To make *one hundred pills*	**100 pills**

Uniformly incorporate the oils with the other ingredients, add enough of the tincture to form a mass, and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ ALOINI COMPOSITÆ

Compound Pills of Aloin

Pil. Aloin. Co.

Aloin, *three and twenty-five hundredths grammes* . . . . . **3.25 Gm.**
Resin of Podophyllum, *eight-tenths of a gramme* . . . . . **0.80 Gm.**
Pilular Extract of Belladonna Leaves, *one and six-tenths grammes* . . . . . **1.60 Gm.**

To make *one hundred pills* . . . . . **100 pills**

Uniformly mix the several ingredients, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ ALOINI, STRYCHNINÆ ET BELLADONNÆ

Pills of Aloin, Strychnine and Belladonna

Pil. A. S. et B.

Aloin, *one and three-tenths grammes* . . . . . **1.30 Gm.**
Strychnine, *five-hundredths of a gramme* . . . . . **0.05 Gm.**
Pilular Extract of Belladonna Leaves, *eight-tenths of a gramme* **0.80 Gm.**

To make *one hundred pills* . . . . . **100 pills**

Uniformly mix the several ingredients, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ ALOINI, STRYCHNINÆ ET BELLADONNÆ COMPOSITÆ

Compound Pills of Aloin, Strychnine and Belladonna

Pil. A. S. et B. Co.

Aloin, *one and three-tenths grammes* . . . . . **1.30 Gm.**
Strychnine, *five-hundredths of a gramme* . . . . . **0.05 Gm.**
Pilular Extract of Belladonna Leaves, *eight-tenths of a gramme* **0.80 Gm.**
Extract of Cascara Sagrada, *three and twenty-five hundredths grammes* . . . . . **3.25 Gm.**

To make *one hundred pills* . . . . . **100 pills**

Uniformly mix the several ingredients, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ ANTIDYSPEPTICÆ

Antidyspeptic Pills

Pil. Antidyspep.

Strychnine, *sixteen hundredths of a gramme*	0.16 Gm.
Ipecac, in fine powder, *sixty-five hundredths of a gramme*	0.65 Gm.
Pilular Extract of Belladonna Leaves, *sixty-five hundredths of a gramme*	0.65 Gm.
Mass of Mercury, *thirteen grammes*	13.00 Gm.
Compound Extract of Colocynth, *thirteen grammes*	13.00 Gm.
To make *one hundred pills*	100 pills

Uniformly mix the strychnine, ipecac and extract of belladonna leaves, then incorporate the other ingredients, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ ANTIMONII COMPOSITÆ

Compound Pills of Antimony

Pil. Antimon. Co. Plummer's Pills

Sulphurated Antimony, *four grammes*	4 Gm.
Mild Mercurous Chloride, *four grammes*	4 Gm.
Guaiac, in fine powder, *eight grammes*	8 Gm.
Castor Oil, *a sufficient quantity,*	
To make *one hundred pills*	100 pills

Uniformly mix the solid ingredients, form a mass with sufficient castor oil, and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ ANTIPERIODICÆ

Antiperiodic Pills

Pil. Antiperiod. Warburg's Pills

Extract of Aloes, in fine powder, *six and five-tenths grammes*	6.5 Gm.
Rhubarb, in fine powder, *three and two-tenths grammes*	3.2 Gm.
Angelica Fruit, in fine powder, *three and two-tenths grammes*	3.2 Gm.
Inula, in fine powder, *one and six-tenths grammes*	1.6 Gm.
Saffron, in fine powder, *one and six-tenths grammes*	1.6 Gm.
Fennel, in fine powder, *one and six-tenths grammes*	1.6 Gm.

Zedoary, in fine powder, *eight-tenths of a gramme*	0.8 Gm.
Cubeb, in fine powder, *eight-tenths of a gramme*	0.8 Gm.
Myrrh, in fine powder, *eight-tenths of a gramme*	0.8 Gm.
Agaric, in fine powder, *eight-tenths of a gramme*	0.8 Gm.
Camphor, in fine powder, *eight-tenths of a gramme*	0.8 Gm.
Quinine Sulphate, *nine grammes*	9.0 Gm.
Extract of Gentian, *a sufficient quantity,*	
To make *one hundred pills*	100 pills

Mix the powders and quinine sulphate uniformly, make into a mass with the extract of gentian, and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ ANTIPERIODICÆ SINE ALOE

Antiperiodic Pills without Aloes

Pil. Antiperiod. s. Aloe Warburg's Pills without Aloes

Prepare the Pills as directed under *Pilulæ Antiperiodicæ,* omitting the Extract of Aloes.

AVERAGE DOSE—1 pill.

PILULÆ CATHARTICÆ VEGETABILES

Vegetable Cathartic Pills

(U.S.P. VIII)

Pil. Cathart. Veget.

Compound Extract of Colocynth, *six grammes*	6.0 Gm.
Extract of Hyoscyamus, *three grammes*	3.0 Gm.
Resin of Jalap, in fine powder, *two grammes*	2.0 Gm.
Extract of Leptandra, *one and five-tenths grammes*	1.5 Gm.
Resin of Podophyllum, *one and five-tenths grammes*	1.5 Gm.
Oil of Peppermint, *eight-tenths of a milliliter*	0.8 mil
Diluted Alcohol, *a sufficient quantity,*	
To make *one hundred pills*	100 pills

Mix the compound extract of colocynth intimately with the resin of podophyllum, resin of jalap, and extract of leptandra, and then add the oil of peppermint and the extract of hyoscyamus, form a mass with sufficient diluted alcohol and divide it into *one hundred pills.*

AVERAGE DOSE—2 pills.

PILULÆ COLOCYNTHIDIS COMPOSITÆ

Compound Pills of Colocynth

Pil. Colocynth. Co. Pilulæ Cocciæ Cochia Pills

Extract of Colocynth, *one and one-tenth grammes*	**1.1 Gm.**
Aloes, *thirteen grammes*	**13.0 Gm.**
Resin of Scammony, *thirteen grammes*	**13.0 Gm.**
Oil of Clove, *one and five-tenths milliliters*	**1.5 mils**
Diluted Alcohol, *a sufficient quantity,*	
To make *one hundred pills*	**100 pills**

Uniformly mix the solid ingredients, incorporate the oil, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ COLOCYNTHIDIS ET HYOSCYAMI

Pills of Colocynth and Hyoscyamus

Pil. Colocynth. et Hyoscy.

Extract of Colocynth, *sixty-five hundredths of a gramme*	**0.65 Gm.**
Aloes, *nine and seven-tenths grammes*	**9.70 Gm.**
Resin of Scammony, *nine and seven-tenths grammes*	**9.70 Gm.**
Extract of Hyoscyamus, *nine and seven-tenths grammes*	**9.70 Gm.**
Oil of Clove, *one milliliter*	**1.00 mil**
To make *one hundred pills*	**100 pills**

Uniformly mix the solid ingredients, incorporate the oil, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ COLOCYNTHIDIS ET PODOPHYLLI

Pills of Colocynth and Podophyllum

Pil. Colocynth. et Podoph.

Compound Extract of Colocynth, *sixteen and two-tenths grammes*	**16.2 Gm.**
Resin of Podophyllum, *one and six-tenths grammes*	**1.6 Gm.**
Syrup, *a sufficient quantity,*	
To make *one hundred pills*	**100 pills**

Uniformly mix the ingredients, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ DIGITALIS, SCILLÆ ET HYDRARGYRI

Pills of Digitalis, Squill and Mercury

Pil. Digit. Scill. et Hydrarg. Niemeyer Pills for Dropsy Guy's Pills

Digitalis, in fine powder, *six and five-tenths grammes*	**6.5 Gm.**
Squill, in fine powder, *six and five-tenths grammes*	**6.5 Gm.**
Mass of Mercury, *six and five-tenths grammes*	**6.5 Gm.**
Clarified Honey, *a sufficient quantity,*	
To make *one hundred pills*	**100 pills**

Uniformly mix the solid ingredients, form a mass with the aid of the honey, and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ FERRI, QUININÆ, ALOES ET NUCIS VOMICÆ

Pills of Iron, Quinine, Aloes and Nux Vomica

Pil. Ferr. Quin. Aloe. et Nuc. Vom. Pilulæ Quadruplices, N.F. III
Quadruplex Pills Pilulæ Ferri et Quininæ Compositæ

Exsiccated Ferrous Sulphate, *six and five-tenths grammes*	**6.5 Gm.**
Quinine Sulphate, *six and five-tenths grammes*	**6.5 Gm.**
Aloes, *six and five-tenths grammes*	**6.5 Gm.**
Extract of Nux Vomica, *one and six-tenths grammes*	**1.6 Gm.**
Extract of Gentian, *a sufficient quantity,*	
To make *one hundred pills*	**100 pills**

Mix the extract of nux vomica with the aloes, thoroughly incorporate the ferrous sulphate and quinine sulphate, then form a mass with the extract of gentian and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ FERRI, QUININÆ, STRYCHNINÆ ET ARSENI FORTIORES

Stronger Pills of Iron, Quinine, Strychnine and Arsenic

Pil. Ferr. Quin. Strych. et Arsen. Fort. Pilulæ Metallorum, N.F. III
Metallic Pills Pilulæ Metallorum Amaræ Bitter Metallic Pills

Reduced Iron, *six and five-tenths grammes*	**6.50 Gm.**
Quinine Sulphate, *six and five-tenths grammes*	**6.50 Gm.**

Strychnine, *thirty-two hundredths of a gramme* . . . . . 0.32 Gm.
Arsenic Trioxide, *thirty-two hundredths of a gramme* . . . . . 0.32 Gm.
Clarified Honey, *a sufficient quantity,*

To make *one hundred pills* . . . . . 100 pills

Mix the ingredients intimately, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ FERRI, QUININÆ, STRYCHNINÆ ET ARSENI MITES

Mild Pills of Iron, Quinine, Strychnine and Arsenic

Pil. Ferr. Quin. Strych. et Arsen. Mit. Aitken Tonic Pills

Reduced Iron, *four and five-tenths grammes* . . . . . 4.50 Gm.
Quinine Sulphate, *six and five-tenths grammes* . . . . . 6.50 Gm.
Strychnine, *thirteen-hundredths of a gramme* . . . . . 0.13 Gm.
Arsenic Trioxide, *thirteen-hundredths of a gramme* . . . . . 0.13 Gm.
Clarified Honey, *a sufficient quantity,*

To make *one hundred pills* . . . . . 100 pills

Mix the ingredients intimately, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ GLYCERYLIS NITRATIS

Pills of Nitroglycerin

Pil. Glycer. Nit. Pilulæ Glonoini, N.F. III Pills of Glonoin

Spirit of Glyceryl Trinitrate, *six and five-tenths grammes* . . . 6.5 Gm.
Althæa, in fine powder, *six and five-tenths grammes* . . . . . 6.5 Gm.
Confection of Rose, *a sufficient quantity,*

To make *one hundred pills* . . . . . 100 pills

Mix the spirit of nitroglycerin intimately with the powdered althæa, expose the mixture for a short time to the air that the alcohol may evaporate, avoiding heat, then make a mass with the aid of confection of rose, and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ LAXATIVÆ COMPOSITÆ

Compound Laxative Pills

(U.S.P. VIII)

Pil. Lax. Co.

Aloin, *one and three-tenths grammes*	**1.30 Gm.**
Strychnine, *five-hundredths of a gramme*	**0.05 Gm.**
Pilular Extract of Belladonna Leaves, *eight-tenths of a gramme*	**0.80 Gm.**
Ipecac, in fine powder, *four-tenths of a gramme*	**0.40 Gm.**
Glycyrrhiza, in fine powder, *four and six-tenths grammes*	**4.60 Gm.**
Syrup, *a sufficient quantity,*	
To make *one hundred pills*	**100 pills**

Triturate the aloin, strychnine, ipecac, and glycyrrhiza together thoroughly, so as to produce a uniform powder. Incorporate with this the extract of belladonna leaves and sufficient syrup to form a mass, and divide it into *one hundred pills.*

AVERAGE DOSE—2 pills.

PILULÆ LAXATIVÆ POST PARTUM

Post Partum Laxative Pills

Pil. Lax. Post Part. Barker's Post Partum Pills

Compound Extract of Colocynth, *eleven grammes*	**11.0 Gm.**
Aloes, *five and five-tenths grammes*	**5.5 Gm.**
Extract of Nux Vomica, *two and five-tenths grammes*	**2.5 Gm.**
Resin of Podophyllum, *five-tenths of a gramme*	**0.5 Gm.**
Ipecac, in fine powder, *five-tenths of a gramme*	**0.5 Gm.**
Extract of Hyoscyamus, *eight grammes*	**8.0 Gm.**
Diluted Alcohol, *a sufficient quantity,*	
To make *one hundred pills*	**100 pills**

Mix the ingredients intimately, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ OPII, DIGITALIS ET QUININÆ

Pills of Opium, Digitalis and Quinine

Pil. Opil, Digit. et Quin. Niemeyer Pills for Phthisis

Powdered Opium, *one gramme*	**1.0 Gm.**
Digitalis, in fine powder, *six and five-tenths grammes*	**6.5 Gm.**

Quinine Sulphate, *six and five-tenths grammes* . . . . . 6.5 Gm.
Clarified Honey, *a sufficient quantity,*
To make *one hundred pills*. . . . . .100 pills

Mix the ingredients intimately, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ OPII ET CAMPHORÆ

Pills of Opium and Camphor

Pil. Opii et Camph.

Powdered Opium, *six and five-tenths grammes* . . . . . 6.5 Gm.
Camphor, *thirteen grammes* . . . . . 13.0 Gm.
Clarified Honey, *a sufficient quantity,*
To make *one hundred pills*. . . . . .100 pills

Mix the ingredients intimately, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ OPII ET PLUMBI

Pills of Opium and Lead

Pil. Opii et Plumb.

Powdered Opium, *six and five-tenths grammes* . . . . . 6.5 Gm.
Lead Acetate, *six and five-tenths grammes* . . . . . 6.5 Gm.
Clarified Honey, *a sufficient quantity,*
To make *one hundred pills*. . . . . .100 pills

Mix the ingredients intimately, form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

PILULÆ RHEI

Pills of Rhubarb

Pil. Rhei

Rhubarb, in fine powder, *twenty grammes* . . . . . 20 Gm.
Soap, in fine powder, *six grammes*. . . . . 6 Gm.
Water, *a sufficient quantity,*
To make *one hundred pills*. . . . . 100 pills

Form a mass and divide it into *one hundred pills.*

AVERAGE DOSE—1 pill.

POTASSA CUM CALCE

Potassa with Lime

Pot. c. Calc.

Potassium Hydroxide, *fifty grammes*	**50 Gm.**
Calcium Oxide, *fifty grammes*	**50 Gm.**
To make *one hundred grammes*	**100 Gm.**

Triturate the ingredients together in a warm mortar, so as to form a powder, and keep it in a well-closed container.

PULVIS ACETANILIDI COMPOSITUS

Compound Acetanilid Powder

(U.S.P. VIII)

Pulv. Acetan. Co.

Acetanilid, *seventy grammes*	**70 Gm.**
Caffeine, *ten grammes*	**10 Gm.**
Sodium Bicarbonate, *twenty grammes*	**20 Gm.**
To make *one hundred grammes*	**100 Gm.**

Reduce the ingredients to a fine powder and mix them thoroughly.

AVERAGE DOSE—Metric, 0.3 Gm.—Apothecaries, 5 grains.

PULVIS ALOES ET CANELLÆ

Powder of Aloes and Canella

Pulv. Aloe. et Canell. **Hiera Picra**

Aloes, in fine powder, *eighty grammes*	**80 Gm.**
Canella, in fine powder, *twenty grammes*	**20 Gm.**
To make *one hundred grammes*	**100 Gm.**

Mix the powders intimately.

AVERAGE DOSE—Metric, 0.3 Gm.—Apothecaries, 5 grains.

PULVIS ANTIMONIALIS

Antimonial Powder

Pulv. Antimon. **James' Powder**

Antimony Oxide, *thirty-three grammes*	**33 Gm.**
Precipitated Calcium Phosphate, *sixty-seven grammes*	**67 Gm.**
To make *one hundred grammes*	**100 Gm.**

Mix the powders intimately.

AVERAGE DOSE—Metric, 0.2 Gm.—Apothecaries, 3 grains.

PULVIS ANTISEPTICUS

Soluble Antiseptic Powder

Pulv. Antisept. Pulvis Antisepticus Solubilis

Salicylic Acid, *five grammes*	5 Gm.
Phenol, *one gramme*	1 Gm.
Eucalyptol, *one gramme*	1 Gm.
Menthol, *one gramme*	1 Gm.
Thymol, *one gramme*	1 Gm.
Zinc Sulphate, *one hundred and twenty-five grammes*	125 Gm.
Boric Acid, in impalpable powder, *eight hundred and sixty-six grammes*	866 Gm.
To make *one thousand grammes*	1000 Gm.

Triturate the salicylic acid and zinc sulphate to a very fine powder, add the phenol, eucalyptol, menthol and thymol, previously liquefied by trituration, and continue the trituration, adding the boric acid, in small portions at a time, until a uniform, fine powder is obtained. Finally pass the powder through a No. 80 sieve.

PULVIS AROMATICUS RUBEFACIENS

Rubefacient Spice Powder

Pulv. Arom. Rubefac. *Replacing* Emplastrum Aromaticum N.F. III

Clove, in No. 40 powder, *thirty grammes*	30 Gm.
Saigon Cinnamon, in No. 60 powder, *thirty grammes*	30 Gm.
Jamaica Ginger, in No. 40 powder, *twenty grammes*	20 Gm.
Capsicum, in No. 40 powder, *twenty grammes*	20 Gm.
To make *one hundred grammes*	100 Gm.

Mix the powders thoroughly and keep the product in a tightly-closed container.

NOTE—When Rubefacient Spice Powder is needed for *Spice Poultice,* place the required quantity in a flat muslin bag and moisten it with either diluted alcohol or vinegar, previously heated.

PULVIS CRETÆ AROMATICUS

Aromatic Powder of Chalk

Pulv. Cret. Arom.

Saigon Cinnamon, *eight grammes*	8 Gm.
Myristica, *six grammes*	6 Gm.

Clove, *three grammes*	3 Gm.
Cardamom Seed, *two grammes*	2 Gm.
Prepared Chalk, *twenty-five grammes*	25 Gm.
Sugar, *fifty-six grammes*	56 Gm.
To make *one hundred grammes*	100 Gm.

Mix the ingredients and reduce them to a fine powder. Pass this through a fine sieve, and afterwards rub it lightly in a mortar. Keep it in a stoppered bottle.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

PULVIS CRETÆ ET OPII AROMATICUS

Aromatic Powder of Chalk and Opium

Pulv. Cret. et Opii Arom. Pulvis Cretæ Aromaticus cum Opio, N.F. III

Aromatic Powder of Chalk, *ninety-seven and five-tenths grammes*	97.5 Gm.
Powdered Opium, *two and five-tenths grammes*	2.5 Gm.
To make *one hundred grammes*	100 Gm.

Mix the powders intimately.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

PULVIS GAMBIR COMPOSITUS

Compound Powder of Gambir

Pulv. Gambir Co. Pulvis Catechu Compositus, N.F. III

Gambir, in fine powder, *forty grammes*	40 Gm.
Kino, in fine powder, *twenty grammes*	20 Gm.
Krameria, in fine powder, *twenty grammes*	20 Gm.
Saigon Cinnamon, in fine powder, *ten grammes*	10 Gm.
Myristica, in fine powder, *ten grammes*	10 Gm.
To make *one hundred grammes*	100 Gm.

Mix the powders intimately, pass the mixture through a fine sieve, and afterwards rub it lightly in a mortar. Keep it in a stoppered bottle.

AVERAGE DOSE—Metric, 1.3 Gm.—Apothecaries, 20 grains.

PULVIS HYDRARGYRI CHLORIDI MITIS ET JALAPÆ

Powder of Mild Mercurous Chloride and Jalap

Pulv. Hydrarg. Chlor. Mit. et Jalap. Calomel and Jalap

Mild Mercurous Chloride, *thirty-four grammes*	34 Gm.
Jalap, in fine powder, *sixty-six grammes*	66 Gm.
To make *one hundred grammes*	100 Gm.

Mix them intimately.

AVERAGE DOSE—Metric, 0.65 Gm.—Apothecaries, 10 grains.

PULVIS KINO ET OPII COMPOSITUS

Compound Powder of Kino and Opium

Pulv. Kino et Opii Co. Pulvis Kino Compositus, N.F. III

Kino, in fine powder, *seventy-five grammes*	75 Gm.
Powdered Opium, *five grammes*	5 Gm.
Saigon Cinnamon, in fine powder, *twenty grammes*	20 Gm.
To make *one hundred grammes*	100 Gm.

Mix the powders intimately, pass the mixture through a moderately fine sieve, and afterwards rub it lightly in a mortar. Keep it in a stoppered bottle.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

PULVIS MYRICÆ COMPOSITUS

Compound Powder of Bayberry

Pulv. Myric. Co. Composition Powder

Bayberry Bark, *sixty grammes*	60 Gm.
Jamaica Ginger, *thirty grammes*	30 Gm.
Capsicum, *five grammes*	5 Gm.
Clove, *five grammes*	5 Gm.
To make *one hundred grammes*	100 Gm.

Reduce the substances to a moderately fine powder and mix them intimately.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

PULVIS PANCREATINI COMPOSITUS

Compound Pancreatin Powder

Pulv. Pancreat. Co.

Pulvis Pancreaticus Compositus, N.F. III Peptonizing Powder

Pancreatin, *twenty grammes*	20 Gm.
Sodium Bicarbonate, *eighty grammes*	80 Gm.
To make *one hundred grammes*	100 Gm.

Mix them by trituration.

NOTE—One and five-tenths grammes of this powder is sufficient to peptonize 500 milliliters of fresh milk by proceeding as follows: Dissolve the compound pancreatin powder in 125 milliliters of tepid water, contained in a suitable flask or other vessel, and afterwards add 500 milliliters of fresh milk, previously heated to 38° C. Maintain the mixture at this temperature during thirty minutes, and then transfer it to a cool place, preferably a refrigerator.

Do not use peptonized milk which has been kept longer than twenty-four hours or which has developed a bitter taste.

PULVIS RHEI ET MAGNESIÆ ANISATUS

Anisated Powder of Rhubarb and Magnesia

Pulv. Rhei et Magnes. Anis. Compound Anise Powder

Rhubarb, in fine powder, *thirty-five grammes*	35 Gm.
Heavy Magnesium Oxide, *sixty-five grammes*	65 Gm.
Anethol, *eight milliliters*	8 mils
Alcohol, *ten milliliters*	10 mils

Mix the powders, add the anethol, previously dissolved in the alcohol, and triturate until a uniform mixture results. Preserve it in well-stoppered bottles.

AVERAGE DOSE—Infants, Metric, 0.3 Gm.—Apothecaries, 5 grains.

PULVIS TALCI COMPOSITUS

Compound Powder of Talc

Pulv. Talc. Co.

Pulvis Talci Salicylicus, N.F. III Boro-Salicylated Powder of Talc

Salicylic Acid, in fine powder, *thirty grammes*	30 Gm.
Boric Acid, in fine powder, *one hundred grammes*	100 Gm.
Talc, in fine powder, *eight hundred and seventy grammes*	870 Gm.
To make *one thousand grammes*	1000 Gm.

Mix the salicylic acid and boric acid intimately and then add the talc in portions, thoroughly mixing after each addition.

SALIA EFFERVESCENTIA

Granular Effervescent Salts

The General Processes given below are to be used for preparing the effervescent salts official in this Formulary. Two methods are outlined; the one to be used being determined by the quantity of material taken. The products, however, from both processes should be identical.

The citric acid directed in the formulas should be in uneffloresced crystals and be finely powdered just before using. All other ingredients should be well dried at a temperature not exceeding 50° C., until they cease to lose weight, and then finely powdered and passed through a No. 60 sieve. As atmospheric dampness, if present, will be absorbed by the finished salt and destroy the effervescent character of the product, it is important that these preparations be made in an atmosphere free from moisture.

Directions for Granulating in an Oven.—Having prepared the citric acid and the other ingredients of the formula as directed above, intimately mix the powders, without trituration, adding the citric acid last, and spread the resulting product evenly, about 10 mm. thick, on a sheet of paper on a canvas tray, glass plate, or in a shallow porcelain or enameled dish, and place it in an oven, heated to a temperature between 95° and 105° C. Allow the powder to remain in the oven, without stirring, until it becomes moist and acquires the proper consistence, about that of dough, then force the mass immediately through a No. 6 tinned-iron sieve and dry the product at a temperature not exceeding 50° C. When dry, again pass the granular powder through a No. 6 tinned-iron sieve, and immediately transfer it to dry bottles or containers, and hermetically seal them.

Directions for Granulating on a Water Bath.—If a small quantity of the salt is to be prepared, the powders, mixed as directed above, may be transferred to a covered dish on a water bath or to a double boiler, heated by water actively boiling, the inner dish being in contact with the water, and the resulting pasty mass stirred until dry. The dry granules should be immediately passed through a No. 6 tinned-iron sieve and transferred to a dry container, which should then be hermetically sealed.

SAL CAROLINUM FACTITIUM

Artificial Carlsbad Salt

Sal. Carol. Fact.

1. *In dry, amorphous form:*

Potassium Sulphate, *two grammes*	2 Gm.
Sodium Chloride, *eighteen grammes*	18 Gm.
Sodium Bicarbonate, *thirty-six grammes*	36 Gm.
Sodium Sulphate, *one hundred grammes*	100 Gm.
To make about *one hundred grammes*	100 Gm.

Mix the sulphates and chloride and dry to constant weight at about 40° C., cool, add the sodium bicarbonate and mix thoroughly.

2. *In crystalline form:*

Potassium Sulphate, in crystals, *two grammes*	2 Gm.
Sodium Chloride, in crystals, *eighteen grammes*	18 Gm.
Monohydrated Sodium Carbonate, *twenty-eight grammes*	28 Gm.
Sodium Sulphate, in crystals, *one hundred grammes*	100 Gm.
Distilled Water, *one hundred milliliters*	100 mils
To make about *one hundred and eighty grammes*	180 Gm.

Dissolve the potassium sulphate and sodium chloride in the distilled water, and add this solution to the other two salts, previously melted in a tared dish, at a gentle heat, in their own water of crystallization. Evaporate the mixture to *one hundred and eighty grammes*, set it aside in a cool place, and stir it frequently, to prevent the formation of large crystals, taking care, however, that none of the salt separates in a pulverulent form. Distribute any remaining mother liquor uniformly over the crystals, and dry the whole mixture sufficiently by exposure to air, so that it will retain its crystalline character.

NOTE—A solution of 1 Gm. of the dry or 1.75 Gm. of the crystalline salt in 200 mils of water is similar to an equal volume of Carlsbad water (Sprudel) in its main constituents.

SAL CAROLINUM FACTITIUM EFFERVESCENS

Effervescent Artificial Carlsbad Salt

Sal. Carol. Fact. Eff. Pulvis Salis Carolini Factitii Effervescens, N.F. III

Artificial Carlsbad Salt, in the dry form, *two hundred and sixty-six grammes*	266 Gm.
Sodium Bicarbonate, dried and powdered, *four hundred grammes*	400 Gm.
Tartaric Acid, dried and powdered, *one hundred and fifty-seven grammes*	157 Gm.
Citric Acid, in uneffloresced crystals, *two hundred and fifty grammes*	250 Gm.
To make about *one thousand grammes*	1000 Gm.

Prepare an effervescent salt as directed in the General Process (see page 184).

AVERAGE DOSE—Metric, 6 Gm.—Apothecaries, 90 grains.

NOTE—A solution of 6 Gm. of this preparation in 200 mils of water is similar to an equal volume of Carlsbad water (Sprudel) in its main constituents.

SAL KISSINGENSE FACTITIUM

Artificial Kissingen Salt

Sal Kissingen. Fact.

Potassium Chloride, in crystals, *seventeen grammes*	17 Gm.
Sodium Chloride, in crystals, *three hundred and fifty-seven grammes*	357 Gm.
Magnesium Sulphate, *one hundred and twenty grammes*	120 Gm.
Sodium Bicarbonate, dried, *one hundred and seven grammes*	107 Gm.

Dry the magnesium sulphate to constant weight at 110° C., cool, add the other ingredients and mix thoroughly.

NOTE—A solution of 1.5 Gm. of this preparation in 200 mils of water is similar to an equal volume of Kissingen water (Rakoczi Spring) in its main constituents.

SAL KISSINGENSE FACTITIUM EFFERVESCENS

Effervescent Artificial Kissingen Salt

Sal Kissingen. Fact. Eff. Pulvis Salis Kissingensis Factitii Effervescens, N.F. III

Artificial Kissingen Salt, dried and powdered, *four hundred grammes*	400 Gm.
Sodium Bicarbonate, dried and powdered, *four hundred and six grammes*	406 Gm.

Tartaric Acid, dried and powdered, *ninety-four grammes* . . .	94 Gm.
Citric Acid, in uneffloresced crystals, *two hundred and fifty grammes*	250 Gm.
To make about *one thousand grammes* . . .	1000 Gm.

Prepare an effervescent salt as directed in the General Process (see page 184).

AVERAGE DOSE—Metric, 5.5 Gm.—Apothecaries, 80 grains.

NOTE—A solution of 5.5 Gm. of this preparation in 200 mils of water is similar to an equal volume of Kissingen water (Rakoczi Spring) in its main constituents.

SAL LITHII CITRATIS EFFERVESCENS

Effervescent Salt of Lithium Citrate

(U.S.P. VIII)

Sal Lith. Cit. Eff.

Lithium Citrate, *fifty grammes*	50 Gm.
Sodium Bicarbonate, dried and powdered, *five hundred and seventy grammes*	570 Gm.
Tartaric Acid, dried and powdered, *three hundred grammes* . . .	300 Gm.
Citric Acid, uneffloresced crystals, *one hundred and ninety-five grammes*	195 Gm.
To make about *one thousand grammes* . . .	1000 Gm.

Prepare an effervescent salt as directed in the General Process (see page 184).

AVERAGE DOSE—Metric, 8 Gm.—Apothecaries, 120 grains.

SAL POTASSII BROMIDI EFFERVESCENS

Effervescent Salt of Potassium Bromide

Sal Pot. Brom. Eff. Pulvis Potassii Bromidi Effervescens, N.F. III

Potassium Bromide, dried, *one hundred and sixty-six grammes*	166 Gm.
Sodium Bicarbonate, dried, *five hundred and thirty grammes* . .	530 Gm.
Tartaric Acid, dried, *two hundred and four grammes*	204 Gm.
Citric Acid, in uneffloresced crystals, *two hundred and fifty grammes*	250 Gm.
To make about *one thousand grammes* . . .	1000 Gm.

Prepare an effervescent salt as directed in the General Process (see page 184).

AVERAGE DOSE—Metric, 6 Gm.—Apothecaries, 90 grains.

SAL POTASSII BROMIDI EFFERVESCENS COMPOSITUM

Compound Effervescent Salt of Potassium Bromide

Sal Pot. Brom. Eff. Co.

Pulvis Potassii Bromidi Effervescens cum Caffeina, N.F. III — Effervescent Potassium Bromide with Caffeine

Caffeine, *eight grammes*	8 Gm.
Potassium Bromide, in crystals, *eighty-three grammes*	83 Gm.
Lithium Carbonate, *forty-two grammes*	42 Gm.
Sodium Bicarbonate, dried, *five hundred and eighty-seven grammes*	587 Gm.
Tartaric Acid, dried, *one hundred and eighty grammes*	180 Gm.
Citric Acid, in uneffloresced crystals, *two hundred and fifty grammes*	250 Gm.
To make about *one thousand grammes*	1000 Gm.

Prepare an effervescent salt as directed in the General Process (see page 184).

AVERAGE DOSE—Metric, 6 Gm.—Apothecaries, 90 grains.

SAL VICHYANUM FACTITIUM

Artificial Vichy Salt

Sal Vichy. Fact.

Sodium Bicarbonate, dried, *eight hundred and forty-six grammes*	846.0 Gm.
Potassium Carbonate, dried, *thirty-eight and five-tenths grammes*	38.5 Gm.
Magnesium Sulphate, *eighty grammes*	80.0 Gm.
Sodium Chloride, *seventy-seven grammes*	77.0 Gm.
To make about *one thousand grammes*	1000 Gm.

Dry the magnesium sulphate to constant weight at 110° C., cool, add the other ingredients, and mix thoroughly.

NOTE—A solution of 1 Gm. of this preparation in 200 mils of water is similar to an equal volume of Vichy water (Grande Grille Spring) in its main constituents.

SAL VICHYANUM FACTITIUM EFFERVESCENS

Effervescent Artificial Vichy Salt

Sal Vichy. Fact. Eff. Pulvis Salis Vichyani Factitii Effervescens, N.F. III

Artificial Vichy Salt, dried and powdered, *two hundred and fifty grammes* . . . . . **250.0 Gm.**
Sodium Bicarbonate, dried and powdered, *four hundred and eighty-five and five-tenths grammes* . . . . . **485.5 Gm.**
Tartaric Acid, dried and powdered, *one hundred and sixty-four and five-tenths grammes* . . . . . **164.5 Gm.**
Citric Acid, in uneffloresced crystals, *two hundred and fifty grammes* **250.0 Gm.**

To make about *one thousand grammes* . . **1000 Gm.**

Prepare an effervescent salt as directed in the General Process (see page 184).

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 60 grains.

NOTE—A solution of 3.75 Gm. of this preparation in 200 mils of water is similar to an equal volume of Vichy water (Grande Grille Spring) in its main constituents.

SAL VICHYANUM FACTITIUM EFFERVESCENS CUM LITHIO

Effervescent Artificial Vichy Salt with Lithium

Sal Vichy. Fact. Eff. c. Lith. Pulvis Salis Vichyani Factitii Effervescens cum Lithio, N.F. III

Artificial Vichy Salt, dried and powdered, *two hundred and fifty grammes* . . . . . **250.0 Gm.**
Lithium Citrate, dried and powdered, *eighty-three and three-tenths grammes* . . . . . **83.3 Gm.**
Sodium Bicarbonate, dried and powdered, *four hundred and forty-one and four-tenths grammes* . . . . . **441.4 Gm.**
Tartaric Acid, dried and powdered, *one hundred and twenty-five and four-tenths grammes* . . . . . **125.4 Gm.**
Citric Acid, in uneffloresced crystals, *two hundred and fifty grammes* **250.0 Gm.**

To make about *one thousand grammes* . . **1000 Gm.**

Prepare an effervescent salt as directed in the General Process (see page 184).

AVERAGE DOSE—Metric, 6 Gm.—Apothecaries, 90 grains.

SEVUM BENZOINATUM

Benzoinated Suet

Sev. Benz.

Benzoin, in No. 40 powder, *thirty grammes*	**30 Gm.**
Prepared Suet, *one thousand grammes*	**1000 Gm.**
To make about *one thousand grammes*	**1000 Gm.**

Mix the benzoin thoroughly with the suet and allow the mixture to stand at the room temperature for two hours, then melt it on a water bath and maintain a temperature not exceeding 50° C. during one hour, stirring frequently; finally strain, and stir the mixture until cold.

SODA CUM CALCE

Soda with Lime

Sod. c. Calc. London Paste

Sodium Hydroxide, Calcium Oxide, each, *fifty grammes*	**50 Gm.**
To make *one hundred grammes*	**100 Gm.**

Reduce the sodium hydroxide and calcium oxide, separately, to a powder in a clean iron mortar, previously warmed, and then mix them intimately. Keep the powder in small, well-closed containers.

SODII BORO-BENZOAS

Sodium Boro-Benzoate

Sod. Boro-Benz.

Sodium Borate, in fine powder, *forty-three grammes*	**43 Gm.**
Sodium Benzoate, in fine powder, *fifty-seven grammes*	**57 Gm.**
To make *one hundred grammes*	**100 Gm.**

Mix the powders intimately.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

SPECIES EMOLLIENTES

Emollient Species

Spec. Emoll. Emollient Cataplasm

Althæa Leaves, *twenty grammes*	**20 Gm.**
Mallow Leaves, *twenty grammes*	**20 Gm.**
Melilot, *twenty grammes*	**20 Gm.**

Matricaria, *twenty grammes*	20 Gm.
Linseed, *twenty grammes*	20 Gm.
To make *one hundred grammes*	100 Gm.

Reduce the drugs to a coarse powder, and mix them uniformly.

NOTE—To prepare an *Emollient Poultice*, add a suitable quantity of hot water to this powder.

SPECIES LAXATIVÆ

Laxative Species

Spec. Lax. Species Laxantes, N.F. III St. Germain Tea

Senna, cut, *forty grammes*	40.0 Gm.
Sambucus, *twenty-five grammes*	25.0 Gm.
Fennel, bruised, *twelve and five-tenths grammes*	12.5 Gm.
Anise, bruised, *twelve and five-tenths grammes*	12.5 Gm.
Potassium Bitartrate, in fine powder, *ten grammes*	10.0 Gm.
To make *one hundred grammes*	100 Gm.

Moisten the senna with a small quantity of water; then sprinkle the potassium bitartrate over it as uniformly as possible. When the senna so treated has become dry, mix it lightly and uniformly with the other ingredients.

AVERAGE DOSE—Metric, 1.3 Gm.—Apothecaries, 20 grains.

SPECIES PECTORALES

Pectoral Species

Spec. Pect. Species ad Infusum Pectorale Breast Tea

Althæa, *forty grammes*	40 Gm.
Coltsfoot, *twenty grammes*	20 Gm.
Glycyrrhiza, Russian, *fifteen grammes*	15 Gm.
Anise, *ten grammes*	10 Gm.
Mullein Flowers, *ten grammes*	10 Gm.
Orris, *five grammes*	5 Gm.
To make *one hundred grammes*	100 Gm.

Cut, bruise, and intimately mix the ingredients.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

SPIRITUS ACIDI FORMICI

Spirit of Formic Acid

Sp. Ac. Formic. Spiritus Formicarum Spirit of Ants

Formic Acid, *forty milliliters*	40 mils
Distilled Water, *two hundred and twenty-five milliliters*	225 mils
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the formic acid with the distilled water, and add enough alcohol to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SPIRITUS ÆTHERIS COMPOSITUS

Compound Spirit of Ether

(U.S.P. VIII)

Sp. Æth. Co. Hoffmann's Anodyne

Ether, *three hundred and twenty-five milliliters*	325 mils
Alcohol, *six hundred and fifty milliliters*	650 mils
Ethereal Oil, *twenty-five milliliters*	25 mils
To make about *one thousand milliliters*	1000 mils

Mix them.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SPIRITUS AMMONIÆ ANISATUS

Anisated Spirit of Ammonia

Sp. Ammon. Anis.

Liquor Ammoniæ Anisatus Anisated Solution of Ammonia

Anethol, *thirty milliliters*	30 mils
Ammonia Water, *two hundred milliliters*	200 mils
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the anethol in *seven hundred and seventy milliliters* of alcohol, gradually add the ammonia water and then sufficient alcohol to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

SPIRITUS CARDAMOMI COMPOSITUS

Compound Spirit of Cardamom

Sp. Card. Co.

Oil of Cardamom, *twenty milliliters*	20.0 mils
Oil of Orange, *twenty milliliters*	20.0 mils
Oil of Cinnamon, *two milliliters*	2.0 mils
Oil of Clove, *one milliliter*	1.0 mil
Anethol, *one milliliter*	1.0 mil
Oil of Caraway, *one-tenth of a milliliter*	0.1 mil
Alcohol, *a sufficient quantity,*	
To make *two hundred milliliters*	200 mils

Mix the oils with *one hundred and forty milliliters* of alcohol, and add sufficient alcohol to make the product measure *two hundred milliliters.*

SPIRITUS MYRCIÆ COMPOSITUS

Compound Spirit of Myrcia

Sp. Myrciæ Co. Spiritus Myrciæ, N.F. III

Oil of Myrcia, *eight milliliters*	8.0 mils
Oil of Orange, *five-tenths of a milliliter*	0.5 mil
Oil of Pimenta, *five-tenths of a milliliter*	0.5 mil
Alcohol, *six hundred and ten milliliters*	610.0 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the oils with the alcohol, and gradually add water until the solution measures *one thousand milliliters.* Set the mixture aside, in a well-stoppered bottle, for eight days and then filter it through paper in a covered funnel.

SPIRITUS ODORATUS

Perfumed Spirit

Sp. Odorat.

Oil of Bergamot, *fifteen milliliters*	15 mils
Oil of Lemon, *eight milliliters*	8 mils
Oil of Rosemary, *seven milliliters*	7 mils
Oil of Lavender, *four milliliters*	4 mils
Oil of Orange Flowers, *four milliliters*	4 mils
Acetic Ether, *two milliliters*	2 mils

Water, *one hundred and twenty milliliters*	120 mils
Alcohol, *eight hundred and forty milliliters*	840 mils
To make about *one thousand milliliters*	1000 mils

Dissolve the oils and the acetic ether in the alcohol, and add the water. Set the mixture aside, in a stoppered bottle, during eight days and then filter it through paper in a covered funnel.

SPIRITUS OLEORUM VOLATILIUM

Spirits of Volatile Oils

Any spirit of a volatile oil, for which no formula is provided, may be prepared by the following general formula:

The Volatile Oil, *sixty-five milliliters*	65 mils
Alcohol, *nine hundred and thirty-five milliliters*	935 mils
To make *one thousand milliliters*	1000 mils

Dissolve the volatile oil in the alcohol.

SPIRITUS SINAPIS

Spirit of Mustard

Sp. Sinap.

Volatile Oil of Mustard, *two milliliters*	2 mils
Alcohol, *a sufficient quantity,*	
To make *one hundred milliliters*	100 mils

Mix them.

SPIRITUS VANILLINI COMPOSITUS

Compound Spirit of Vanillin

Sp. Vanil. Co.

Vanillin, *forty grammes*	40 Gm.
Oil of Orange, *ten milliliters*	10 mils
Oil of Cardamom, *two milliliters*	2 mils
Oil of Cinnamon, *one milliliter*	1 mil
Alcohol, *a sufficient quantity,*	
To make *two hundred milliliters*	200 mils

Dissolve the vanillin and the oils in *one hundred and fifty milliliters* of alcohol and then add sufficient alcohol to make the product measure *two hundred milliliters.* Store the spirit in tightly-stoppered, amber-colored bottles, in a cool place, protected from light.

STILI DILUBILES

Paste Pencils

Stil. Dilub. Unna Pencils

Pencils for the direct application of medicinal agents to the skin, used in modern dermatologic practice. The medicinal agent is incorporated with paste consisting of starch, dextrin, tragacanth and sugar, with sufficient water to form a plastic mass. This is rolled into cylinders, of about 5 mm. diameter, which are cut into sections about 5 cm. long, dried on parchment paper at room temperature, and wrapped in tin-foil. The following formula serves as an example:

STILI ACIDI SALICYLICI DILUBILES

Salicylic Acid Pencil

Stil. Acid. Salicyl. Dilub. Stilus Acidi Salicylici Dilubilis, N.F. III

Salicylic Acid, in fine powder, *ten grammes*	**10 Gm.**
Tragacanth, in fine powder, *five grammes*	**5 Gm.**
Starch, in fine powder, *thirty grammes*	**30 Gm.**
White Dextrin, in fine powder, *thirty-five grammes*	**35 Gm.**
Sugar, in fine powder, *twenty grammes*	**20 Gm.**
Distilled Water, *a sufficient quantity* to make a firm, plastic mass.	

One hundred grammes of this material is sufficient to make from 40 to 45 pencils.

SUCCUS CITRI ET PEPSINUM

Lime Juice and Pepsin

Suc. Cit. et Pepsin. Succus Limettæ cum Pepsino, N.F. III

Glycerite of Pepsin, *four hundred milliliters*	**400 mils**
Lime Juice, *six hundred milliliters*	**600 mils**
To make *one thousand milliliters*	**1000 mils**

Add the glycerite of pepsin to the lime juice and filter the mixture. This preparation should not be dispensed unless it has been recently prepared.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

SULPHURIS IODIDUM

Sulphur Iodide

(U.S.P. VIII)

Sulphur. Iod.

Washed Sulphur, *twenty grammes*	**20 Gm.**
Iodine, *eighty grammes*	**80 Gm.**

Mix the sulphur and iodine thoroughly by trituration; introduce the mixture into a flask, close the orifice loosely, and, by means of a water bath, gradually apply a heat not exceeding 60° C., and occasionally agitate until the ingredients combine and become of a uniformly dark color throughout. Then increase the heat to the boiling point of water, so as to fuse the mass. Should any iodine sublime and condense on the glass, incline the flask so as to combine the iodine with the fused mass, and then pour the latter upon a porcelain plate or other suitable cold surface. When it is cold, break the product into pieces of suitable size, and keep them in a glass-stoppered bottle, in a cool place.

Sulphur Iodide occurs in brittle masses having a crystalline fracture and a grayish-black, metallic luster; it has the odor of iodine and a somewhat acrid taste.

Almost insoluble in water; soluble in about 60 parts of glycerin; very soluble in carbon disulphide. Alcohol, ether, or an aqueous solution of potassium iodide dissolves the iodine, leaving the sulphur. Continued boiling with water vaporizes all of the iodine, leaving about 20 per cent. of sulphur as a residue.

On exposing sulphur iodide to the air, it gradually loses iodine. On heating it, some iodine sublimes at first; at a somewhat higher temperature a sublimate is formed, containing both iodine and sulphur. At a still higher temperature, it is almost completely volatilized, leaving only a trace of residue.

Assay.—Mix 0.5 Gm. of finely powdered Sulphur Iodide with 1 Gm. of potassium iodide, and dissolve the mixture in 20 mils of distilled water (the sulphur separating); not less than 28 mils of tenth-normal sodium thiosulphate V.S. is required for complete decolorization of the mixture, starch T.S. being used as an indicator.

SUPPOSITORIA BOROGLYCERINI

Suppositories of Boroglycerin

Suppos. Boroglycer.

Glycerinated Gelatin, *twenty grammes*	**20 Gm.**
Glycerite of Boroglycerin, *fifteen grammes*	**15 Gm.**
Glycerin, *fifteen grammes*	**15 Gm.**

To make *twelve* rectal suppositories.

Melt the glycerinated gelatin on a water bath, add the glycerite of boroglycerin and glycerin and mix well. Pour the uniform mixture into well-oiled moulds of the required size, which should be slightly warmed, and allow it to stand until the suppositories are firm. Dispense the suppositories in glass containers.

SYRUPI

Syrups

The Syrups for which formulas are herein given are, in general, intended to be aqueous solutions of medicinal substances, rendered palatable and preserved from change by the addition of sugar in proper proportions. With few exceptions, the syrups are expected to be perfectly clear, and it is therefore recommended that the solution of the sugar in the clear liquid be effected by the process of "cold solution by percolation," described under *Syrupus*, U. S. Pharmacopœia IX.

Syrups, particularly those containing large proportions of vegetable extractive, though clear when first made, are liable to become turbid on keeping; when this occurs it is permissible to mix the syrups with a small quantity of purified talc, or purified siliceous earth (using from 10 to 25 Gm. for each 1000 mils) and filter the mixture through paper.

Preserve syrups in well-dried bottles, preferably those which have been sterilized. These bottles should not hold more than is likely to be required during four to six weeks. They should be completely filled, carefully stoppered, and stored in a cool, dark place.

SYRUPUS ALLII

Syrup of Garlic

Syr. Allii

Garlic, sliced and bruised, *two hundred grammes*	200 Gm.
Sugar, *eight hundred grammes*	800 Gm.
Diluted Acetic Acid, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Macerate the garlic in *three hundred milliliters* of diluted acetic acid during four days, and express the liquid, avoiding the use of metallic utensils. Then mix the residue with *two hundred milliliters* more of diluted acetic acid, and again express. Mix the expressed liquids, and filter. Pour the filtrate upon the sugar, contained in a suitable vessel, and agitate the mixture until the sugar is dissolved. Lastly, add sufficient diluted acetic acid to make the product measure *one thousand milliliters* and mix thoroughly.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS ALTHÆÆ

Syrup of Althæa

Syr. Althæ.

Althæa, cut in small pieces, *fifty grammes*	50 Gm.
Alcohol, *thirty milliliters*	30 mils
Glycerin, *one hundred milliliters*	100 mils
Sugar, *seven hundred grammes*	700 Gm.
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Wash the althæa with cold water, then macerate it with *four hundred milliliters* of water previously mixed with the alcohol, during three hours, at room temperature without stirring, and strain without expressing the residue. In the strained liquid dissolve the sugar by agitation, without heat, add the glycerin and sufficient water to make the product measure *one thousand milliliters.* Mix thoroughly.

Keep the syrup in well-stoppered, completely filled bottles, in a cool place.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS AMMONII HYPOPHOSPHITIS

Syrup of Ammonium Hypophosphite

Syr. Ammon. Hypophos.

Ammonium Hypophosphite, *thirty-five grammes*	35 Gm.
Diluted Hypophosphorous Acid, *two milliliters*	2 mils
Distilled Water, *one hundred milliliters*	100 mils
Glycerin, *one hundred milliliters*	100 mils
Compound Spirit of Vanillin, *two milliliters*	2 mils
Syrup, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the ammonium hypophosphite in the distilled water, add the diluted hypophosphorous acid, filter, and then add the glycerin, compound spirit of vanillin and sufficient syrup to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS ASARI COMPOSITUS

Compound Syrup of Asarum

Syr. Asar. Co.

Asarum, in No. 40 powder, *sixty-two grammes*	62.0 Gm.
Alcohol, *two hundred milliliters*	200.0 mils
Cochineal, in fine powder, *one and five-tenths grammes*	1.5 Gm.
Potassium Carbonate, *two and five-tenths grammes*	2.5 Gm.
Fluidextract of Ipecac, *three milliliters*	3.0 mils
Sugar, *seven hundred and twenty-five grammes*	725.0 Gm.
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the asarum intimately with the cochineal and potassium carbonate, previously triturated together. Moisten the powder with a sufficient quantity of a menstruum prepared by mixing the alcohol with *three hundred and seventy-five milliliters* of water, and allow the moistened drugs to macerate, in a covered vessel, for twenty-four hours. Then transfer them to a percolator, and pour on the remainder of the menstruum. Allow the percolation to proceed slowly, and when all of the menstruum has been added follow it with water, until the percolate measures *five hundred milliliters.* To this add the fluidextract of ipecac, and afterwards the sugar, and dissolve the latter by agitation. Finally, add sufficient water to make the syrup measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS BROMIDORUM

Syrup of the Bromides

Syr. Bromidor.

Potassium Bromide, *eighty grammes*	80 Gm.
Sodium Bromide, *eighty grammes*	80 Gm.
Ammonium Bromide, *fifty grammes*	50 Gm.
Calcium Bromide, *twenty-five grammes*	25 Gm.
Lithium Bromide, *eight grammes*	8 Gm.
Tincture of Vanilla, *thirty-two milliliters*	32 mils
Compound Tincture of Cudbear, *sixteen milliliters*	16 mils
Compound Syrup of Sarsaparilla, *four hundred and fifty milliliters*	450 mils
Syrup, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the bromides in the compound syrup of sarsaparilla and *four hundred milliliters* of syrup; then add the tinctures, and sufficient syrup to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS CALCII ET SODII HYPOPHOSPHITUM

Syrup of Calcium and Sodium Hypophosphites

Syr. Calc. et Sod. Hypophos.

Calcium Hypophosphite, *thirty-five grammes*	**35.0 Gm.**
Sodium Hypophosphite, *thirty-five grammes*	**35.0 Gm.**
Hypophosphorous Acid, *one and five-tenths milliliters*	**1.5 mils**
Sugar, *seven hundred and seventy-five grammes*	**775.0 Gm.**
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the hypophosphites with the aid of the hypophosphorous acid in *five hundred milliliters* of distilled water, filter the solution, add the sugar to the filtrate and after this has been dissolved by agitation, add sufficient distilled water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS CALCII HYDROCHLOROPHOSPHATIS

Syrup of Calcium Hydrochlorophosphate

Syr. Calc. Hydrochlorophos. Syrupus Calcii Chlorhydrophosphatis, N.F. III

Precipitated Calcium Phosphate, *seventeen and five-tenths grammes*	**17.5 Gm.**
Tincture of Lemon Peel, *twenty milliliters*	**20.0 mils**
Hydrochloric Acid,	
Water,	
Syrup, each, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Triturate the precipitated calcium phosphate with *thirty milliliters* of water, and dissolve it with the aid of hydrochloric acid, avoiding an excess. Then add the tincture of lemon peel, filter the liquid, and wash the filter with a mixture of *thirty milliliters* each of water and of syrup. Lastly, add sufficient syrup to the filtrate to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS CALCII HYPOPHOSPHITIS

Syrup of Calcium Hypophosphite

Syr. Calc. Hypophos.

Calcium Hypophosphite, *thirty-five grammes*	35.0 Gm.
Hypophosphorous Acid, *one and five-tenths milliliters*	1.5 mils
Sugar, *seven hundred and seventy-five grammes*	775.0 Gm.
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the calcium hypophosphite with the aid of the hypophosphorous acid in *five hundred milliliters* of distilled water, filter the solution, add the sugar to the filtrate, and after this has been dissolved by agitation, add sufficient distilled water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS CALCII IODIDI

Syrup of Calcium Iodide

Syr. Calc. Iodid.

Iodine, *seventy-six grammes*	76 Gm.
Iron Wire, fine, bright, and finely cut, *twenty-eight grammes* . .	28 Gm.
Precipitated Calcium Carbonate, *thirty-four grammes*	34 Gm.
Sugar, *seven hundred grammes*	700 Gm.
Distilled Water,	
Syrup, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Add the iron wire to *fifty-seven grammes* of the iodine and *one hundred and seventy-five milliliters* of distilled water, and apply a gentle heat, until the iodine is combined, and the liquid has acquired a greenish color. Filter the liquid through a small filter into a flask containing the remainder of the iodine, wash the filter with about *sixty-two milliliters* of distilled water and then warm the solution gently until the iodine is dissolved, taking care that no iodine is lost by volatilization. Heat to boiling *two hundred and thirty-five milliliters* of distilled water in a capacious dish, and add to it alternately, in small portions, first the precipitated calcium carbonate, and then the solution of iron iodide, stirring briskly and waiting until the violence of the reaction moderates before adding a fresh portion. From time to time, add a little distilled water,

to replace that lost by evaporation. When all of the iron solution and calcium carbonate have been added, continue heating the mixture until it commences to boil, then filter it through a wetted filter, and wash the filter with sufficient distilled water to make the product, when cold, measure *five hundred milliliters*. In this dissolve the sugar by agitation, then add sufficient syrup to make the product measure *one thousand milliliters*, and strain.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

SYRUPUS CALCII LACTOPHOSPHATIS ET FERRI

Syrup of Calcium Lactophosphate and Iron

Syr. Calc. Lactophos. et Ferr. Syrupus Calcii Lactophosphatis cum Ferro, N.F. III

Ferrous Lactate, *eight and five-tenths grammes*	8.5 Gm.
Potassium Citrate, *eight and five-tenths grammes*	8.5 Gm.
Water, *sixty-two and five-tenths milliliters*	62.5 mils
Syrup of Calcium Lactophosphate, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the ferrous lactate and potassium citrate in the water with the aid of heat, and add sufficient syrup of calcium lactophosphate to make the product measure *one thousand milliliters*.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS CIMICIFUGÆ COMPOSITUS

Compound Syrup of Cimicifuga

Syr. Cimicif. Co.

Syrupus Actææ Compositus, N.F. III Compound Syrup of Actæa

Fluidextract of Cimicifuga, *forty milliliters*	40 mils
Fluidextract of Glycyrrhiza, *twenty milliliters*	20 mils
Fluidextract of Senega, *twenty milliliters*	20 mils
Fluidextract of Ipecac, *ten milliliters*	10 mils
Wild Cherry, in moderately fine powder, *forty grammes*	40 Gm.
Purified Talc, *fifteen grammes*	15 Gm.
Sugar, *six hundred and fifty grammes*	650 Gm.
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the wild cherry with *three hundred and seventy-five milliliters* of water, and allow it to macerate during one hour. Then add to it the

fluidextracts and the talc and stir or agitate the mixture frequently and thoroughly during about fifteen minutes. Transfer it to a wetted filter, and, when the liquid ceases to drop from the funnel, wash the contents of the filter with sufficient water to obtain *five hundred milliliters* of filtrate. Dissolve the sugar in this liquid by agitation, and add sufficient water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS CINNAMOMI

Syrup of Cinnamon

Syr. Cinnam.

Saigon Cinnamon, in No. 30 powder, *one hundred grammes* . .	100 Gm.
Alcohol, *fifty milliliters*	50 mils
Sugar, *eight hundred grammes*	800 Gm.
Cinnamon Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the alcohol with *four hundred and fifty milliliters* of cinnamon water, moisten the cinnamon with a sufficient quantity of this menstruum and allow it to macerate for two hours. Then transfer it to a small percolator, and percolate, in the usual manner, using first the remainder of the menstruum above directed, and afterwards, cinnamon water. Collect *four hundred and eighty milliliters* of the percolate and dissolve the sugar in this, then add a sufficient quantity of cinnamon water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS CODEINÆ

Syrup of Codeine

Syr. Codein.

Codeine Sulphate, *two-tenths of a gramme*	0.2 Gm.
Syrup, *a sufficient quantity,*	
To make *one hundred milliliters*	100 mils

Reduce the codeine sulphate to a fine powder and dissolve it in the syrup, which has been warmed.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS ERIODICTYI AROMATICUS

Aromatic Syrup of Eriodictyon

Syr. Eriodict. Arom. Aromatic Syrup of Yerba Santa Syrupus Corrigens

Fluidextract of Eriodictyon, *thirty-two milliliters*	32.0 mils
Solution of Potassium Hydroxide, *twenty-five milliliters*	25.0 mils
Compound Tincture of Cardamom, *sixty-five milliliters*	65.0 mils
Oil of Sassafras, *five-tenths of a milliliter*	0.5 mil
Oil of Lemon, *five-tenths of a milliliter*	0.5 mil
Oil of Clove, *one milliliter*	1.0 mil
Alcohol, *thirty-two milliliters*	32.0 mils
Sugar, *eight hundred grammes*	800.0 Gm.
Magnesium Carbonate, *five grammes*	5.0 Gm.
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the oils in the alcohol, add the fluidextract and the tincture, then the solution of potassium hydroxide and *three hundred and twenty-five milliliters* of water. Shake the mixture thoroughly, add the magnesium carbonate, filter and add sufficient water through the filter to make the liquid measure *five hundred milliliters.* Pour this filtrate upon the sugar contained in a bottle, and dissolve it by placing the bottle in hot water, agitating the contents frequently. Lastly, cool the product and add sufficient water to make the Syrup measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

SYRUPUS FERRI ET MANGANI IODIDI

Syrup of Iron and Manganese Iodide

Syr. Ferr. et Mangan. Iod.

Iodine, *eighty-one and five-tenths grammes*	81.5 Gm.
Iron Wire, fine, bright, and finely cut, *twenty-eight grammes*	28.0 Gm.
Manganese Sulphate, *twenty-six and five-tenths grammes*	26.5 Gm.
Sodium Iodide, *thirty-five and six-tenths grammes*	35.6 Gm.
Sugar, *eight hundred grammes*	800.0 Gm.
Diluted Alcohol,	
Distilled Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Add the iodine to the iron and *two hundred milliliters* of distilled water in a flask, and prepare a solution of ferrous iodide, in the usual manner, aiding the process, if necessary, by heating the contents of the flask, at first gently, and finally to boiling. Filter the liquid through a small filter, directly upon the sugar contained in a suitable bottle graduated to *one thousand milliliters*, and rinse the flask and filter with two portions, of *twenty milliliters* each, of distilled water, adding the rinsings to the filtrate in the bottle. Dissolve the manganese sulphate in *one hundred milliliters* of distilled water, and the sodium iodide in *one hundred milliliters* of diluted alcohol, mix the two solutions and filter the mixture, collecting the filtrate in the bottle which contains the sugar and the iron iodide solution. Wash the filter with *twenty-five milliliters* of cold distilled water, receiving the washings in the same bottle. Agitate the mixture until the sugar has dissolved, then add sufficient distilled water to make the product measure *one thousand milliliters*, and filter.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

SYRUPUS FERRI HYPOPHOSPHITIS

Syrup of Ferric Hypophosphite

Syr. Ferr. Hypophos.

Ferric Hypophosphite, *seventeen and five-tenths grammes* . . .	**17.5 Gm.**
Potassium Citrate, *twenty-five grammes*	**25.0 Gm.**
Sugar, *eight hundred and fifty grammes*	**850.0 Gm.**
Orange Flower Water, *ninety milliliters*	**90.0 mils**
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the ferric hypophosphite and the potassium citrate in *two hundred and twenty-five milliliters* of distilled water, with the aid of heat, and filter. Mix the filtrate with the orange flower water, add sufficient distilled water to make the solution measure *four hundred and fifty milliliters* and dissolve the sugar in this liquid with the aid of heat. Finally add sufficient distilled water to make the product measure *one thousand milliliters*.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS FERRI LACTOPHOSPHATIS

Syrup of Iron Lactophosphate

Syr. Ferr. Lactophos.

Ferrous Lactate, *seventeen and five-tenths grammes*	**17.5 Gm.**
Phosphoric Acid, *seventeen and five-tenths milliliters*	**17.5 mils**
Sugar, *eighty grammes*	**80.0 Gm.**
Distilled Water, *fifty milliliters*	**50.0 mils**
Syrup, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the ferrous lactate in *fifty milliliters* of distilled water with the aid of the phosphoric acid, dissolve the sugar in the solution, and add sufficient syrup to make the product measure *one thousand milliliters*, and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS FERRI PROTOCHLORIDI

Syrup of Ferrous Chloride

Syr. Ferr. Protochlor. Syrup of Protochloride of Iron

Solution of Ferrous Chloride, *fifty milliliters*	**50 mils**
Glycerin, *one hundred and twenty-five milliliters*	**125 mils**
Orange Flower Water, *one hundred and twenty-five milliliters*	**125 mils**
Syrup, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix the solution of ferrous chloride with the glycerin and orange flower water, and add sufficient syrup to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS FERRI, QUININÆ ET STRYCHNINÆ PHOSPHATUM

Syrup of the Phosphates of Iron, Quinine, and Strychnine

(Replacing U.S.P. VIII)

Syr. Ferr. Quin. et Strych. Phos.

Ferric Phosphate, *twenty grammes*	**20.0 Gm.**
Quinine, *twenty-six grammes*	**26.0 Gm.**
Strychnine, *two-tenths of a gramme*	**0.2 Gm.**

Phosphoric Acid, *fifty milliliters*	50.0 mils
Glycerin, *one hundred milliliters*	100.0 mils
Water, *fifty milliliters*	50.0 mils
Syrup, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the ferric phosphate in the water with the aid of heat, then add the phosphoric acid, the quinine and the strychnine, and stir until solution is effected. Filter the liquid into the glycerin, contained in a graduated bottle, add sufficient syrup to make the product measure *one thousand milliliters*, and mix thoroughly.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS FERRI SACCHARATI SOLUBILIS

Syrup of Soluble Saccharated Iron

Syr. Ferr. Sacch. Sol.

Syrupus Ferri Oxydati Solubilis Syrup of Saccharated Oxide of Iron

Syrup of Soluble Oxide of Iron

Saccharated Ferric Oxide, *four hundred and fifteen grammes*	415 Gm.
Syrup, *three hundred and twenty milliliters*	320 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the saccharated ferric oxide in *four hundred milliliters* of water on a water bath, add the syrup and sufficient water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS FICORUM COMPOSITUS

Compound Syrup of Figs

Syr. Ficor. Co.

Figs, cut into small pieces, *three hundred grammes*	300 Gm.
Fluidextract of Senna, *two hundred milliliters*	200 mils
Aromatic Fluidglycerate of Cascara Sagrada, *one hundred milliliters*	100 mils
Oil of Fennel, *one milliliter*	1 mil
Spirit of Peppermint, *three milliliters*	3 mils
Sugar, *four hundred grammes*	400 Gm.
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Add *one thousand milliliters* of boiling water to the figs and digest the mixture at a gentle heat, during two hours, replacing the water from time to time as it evaporates, then strain with pressure and set the strained liquid aside. Again digest the residue with *five hundred milliliters* of boiling water for one hour, replacing the water as it evaporates, and then strain. Mix the strained liquids, evaporate the mixture to *four hundred milliliters*, and while warm dissolve the sugar in the liquid. When the solution is cold add it to a mixture of the fluidextract of senna, aromatic fluidglycerate of cascara sagrada, oil of fennel, and spirit of peppermint. Finally add sufficient water to make the product measure *one thousand milliliters*.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS GLYCYRRHIZÆ

Syrup of Glycyrrhiza

Syr. Glycyrrh. **Syrup of Licorice**

Fluidglycerate of Glycyrrhiza, *two hundred and fifty milliliters*	**250 mils**
Syrup, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

SYRUPUS HYPOPHOSPHITUM COMPOSITUS

Compound Syrup of Hypophosphites

(Replacing U.S.P. VIII)

Syr. Hypophos. Co.

Calcium Hypophosphite, *thirty-five grammes*	**35.000 Gm.**
Potassium Hypophosphite, *seventeen and five-tenths grammes*	**17.500 Gm.**
Sodium Hypophosphite, *seventeen and five-tenths grammes* .	**17.500 Gm.**
Ferric Hypophosphite, *two and twenty-five hundredths grammes*	**2.250 Gm.**
Manganese Hypophosphite, *two and twenty-five hundredths grammes*	**2.250 Gm.**
Quinine, *one and one-tenth grammes*	**1.100 Gm.**
Strychnine, *one hundred and fifteen milligrammes*	**0.115 Gm.**

Sodium Citrate, *three and seventy-five hundredths grammes* .	3.750 Gm.
Diluted Hypophosphorous Acid, *fifteen milliliters* . . .	15.000 mils
Sugar, *seven hundred grammes*	700.000 Gm.
Glycerin, *fifty milliliters.*	50.000 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters* . . .	1000 mils

Rub the ferric and manganese hypophosphites with the sodium citrate, add *thirty milliliters* of water and warm the mixture, with stirring, until a clear greenish solution is obtained. Dissolve the calcium, potassium and sodium hypophosphites in *four hundred milliliters* of water, to which *five milliliters* of diluted hypophosphorous acid has been added; then dissolve the quinine and strychnine in *thirty milliliters* of water and the glycerin, with the aid of *ten milliliters* of diluted hypophosphorous acid, mix the solutions, and dissolve the sugar in them by agitation. Finally add sufficient water to make the product measure *one thousand milliliters*, and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

SYRUPUS IODOTANNICUS

Syrup of Iodotannin

Syr. Iodotan.

Iodine, *two and seven-tenths grammes*	2.7 Gm.
Tannic Acid, *five and four-tenths grammes*	5.4 Gm.
Sugar, *eight hundred grammes*	800.0 Gm.
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Reduce the iodine to a powder, introduce it into a flask with the tannic acid and *four hundred and fifty milliliters* of distilled water, and heat the mixture on a water bath, at a temperature not exceeding 50° C., agitating the flask from time to time, until a drop of the liquid ceases to give a blue coloration with starch T.S. Then add the sugar, and when this is dissolved remove the flask from the water bath, allow the syrup to cool, and finally add sufficient distilled water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS IPECACUANHÆ ET OPII

Syrup of Ipecac and Opium

Syr. Ipecac. et Opii Syrup of Dover's Powder

Tincture of Ipecac and Opium, *eighty-five milliliters*	85 mils
Spirit of Cinnamon, *four milliliters*	4 mils
Cinnamon Water, *thirty-two milliliters*	32 mils
Syrup, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the tincture, spirit and water, then add sufficient syrup to make the product measure *one thousand milliliters*, and mix thoroughly.

Average dose—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS KRAMERIÆ

Syrup of Krameria

(U.S.P. VIII)

Syr. Kramer.

Fluidextract of Krameria, *four hundred and fifty milliliters* .	450 mils
Syrup, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix them.

Average dose—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS MANNÆ

Syrup of Manna

Syr. Mann.

Manna, in flakes, *one hundred and twenty-five grammes*	125 Gm.
Sugar, *seven hundred and seventy-five grammes*	775 Gm.
Alcohol, *sixty-five milliliters*	65 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the manna in *four hundred milliliters* of hot water, add the alcohol, set the liquid aside for twelve hours in a moderately warm place, and then filter it. Dissolve the sugar in the filtrate, with

the aid of a gentle heat, allow the syrup to cool, and add sufficient water, passed through the filter previously used, to make the product measure *one thousand milliliters*.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

SYRUPUS MORPHINÆ ET ACACIÆ

Syrup of Morphine and Acacia

Syr. Morph. et Acac. Syrupus Pectoralis, N.F. III Jackson's Pectoral Syrup

Morphine Hydrochloride, *fifty-five hundredths of a gramme.*	**0.55 Gm.**
Oil of Sassafras, *five-tenths of a milliliter*	**0.50 mil**
Syrup of Acacia, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the morphine hydrochloride in about *sixty-two milliliters* of the syrup, add the oil of sassafras and sufficient syrup of acacia to make the product measure *one thousand milliliters*.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS PAPAVERIS

Syrup of Poppy

Syr. Papaver.

Poppy Capsules, deprived of seeds and in a No. 20 powder, *one hundred grammes*	**100 Gm.**
Sugar, *eight hundred and fifty grammes*	**850 Gm.**
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Loosely pack the powder in a suitable metallic percolator and percolate it with boiling water until it is practically exhausted. Heat the percolate to boiling for two minutes, then concentrate it, on a water bath, to *four hundred and fifty milliliters*, filter and dissolve the sugar in the concentrated percolate. Finally add sufficient water to make the product measure *one thousand milliliters*, strain and bottle the syrup while yet warm.

Preserve Syrup of Poppy in small, completely filled bottles in a cool place.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS PHOSPHATUM COMPOSITUS

Compound Syrup of the Phosphates

Syr. Phos. Co. Chemical Food

Compound Solution of Phosphates, *five hundred milliliters* .	500 mils
Syrup, *three hundred and thirty-four milliliters*	334 mils
Glycerin, *one hundred and fifty milliliters*	150 mils
Tincture of Cudbear, *sixteen milliliters*	16 mils
To make *one thousand milliliters*	1000 mils

Mix the tincture of cudbear with the glycerin and add the other ingredients.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS PHOSPHATUM CUM QUININA ET STRYCHNINA

Syrup of Phosphates with Quinine and Strychnine

Syr. Phos. c. Quin. et Strych.

Syrupus Hydrochlorophosphatum, N.F. III Compound Syrup of Hydrochlorophosphates

Quinine Hydrochloride, *four and four-tenths grammes* . . .	4.40 Gm.
Strychnine Nitrate, *fourteen-hundredths of a gramme*	0.14 Gm.
Compound Solution of Phosphates, *five hundred milliliters* .	500.00 mils
Glycerin, *one hundred and fifty milliliters*	150.00 mils
Syrup, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the quinine and strychnine salts in the glycerin with the aid of heat and add the other ingredients.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS PINI STROBI COMPOSITUS

Compound Syrup of White Pine

Syr. Pin. Strob. Co.

White Pine Bark, in No. 30 powder, *eighty-five grammes* . . .	85.0 Gm.
Wild Cherry, in No. 30 powder, *eighty-five grammes*	85.0 Gm.
Aralia, in No. 30 powder, *ten grammes*	10.0 Gm.
Balsam Poplar Buds, in No. 30 powder, *ten grammes*	10.0 Gm.
Sanguinaria, in No. 30 powder, *eight grammes*	8.0 Gm.
Sassafras, in No. 30 powder, *seven grammes*	7.0 Gm.

Cudbear, *one gramme*	1.0 Gm.
Chloroform, *six milliliters*	6.0 mils
Sugar, *six hundred and fifty grammes*	650.0 Gm.
Glycerin, *one hundred milliliters*	100.0 mils
Oil of Sassafras, *two-tenths of a milliliter*	0.2 mil
Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the vegetable drugs and moisten the powder with a sufficient quantity of a menstruum composed of the glycerin, *one hundred milliliters* of alcohol, and *two hundred milliliters* of water, pack it in a percolator, and macerate for twelve hours. Then continue the percolation, using first the remainder of the menstruum and then a mixture of *one volume* of alcohol and *three volumes* of water until the percolate measures *six hundred milliliters.* In this percolate dissolve the sugar, add the chloroform and oil of sassafras and mix thoroughly. Finally add sufficient water to make the product measure *one thousand milliliters*, and strain.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS PINI STROBI COMPOSITUS CUM MORPHINA

Compound Syrup of White Pine with Morphine

Syr. Pin. Strob. c. Morph. Syrupus Pini Strobi Compositus, N.F. III

Morphine Sulphate, *four-tenths of a gramme*	0.4 Gm.
Compound Syrup of White Pine, *one thousand milliliters*	1000.0 mils

Dissolve the morphine sulphate in the compound syrup of white pine, and mix well.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

SYRUPUS QUINIDINÆ

Syrup of Quinidine

Syr. Quinid. Bitterless Syrup of Quinidine

Quinidine, in fine crystals, *thirty-three grammes*	33.0 Gm.
Oil of Orange, *two-tenths of a milliliter*	0.2 mil
Syrup, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Add the oil and the quinidine to *seven hundred and fifty milliliters* of syrup, contained in a bottle, and shake the mixture thoroughly. Then add sufficient syrup to make the product measure *one thousand milliliters*. Shake it well before dispensing.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS RHAMNI CATHARTICÆ

Syrup of Rhamnus Cathartica

Syr. Rham. Cathart. Syrup of Buckthorn Berries Syrupus Spinæ Cervinæ

Fluidextract of Rhamnus Cathartica, *two hundred milliliters*	200.0 mils
Oil of Fennel, *two-tenths of a milliliter*	0.2 mil
Oil of Cinnamon, *two-tenths of a milliliter*	0.2 mil
Syrup, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Add the oils to the fluidextract and mix this with sufficient syrup to make the product measure *one thousand milliliters*.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

SYRUPUS ROSÆ

Syrup of Rose

(U.S.P. VIII)

Syr. Ros.

Fluidextract of Rose, *one hundred and twenty-five milliliters*	125 mils
Diluted Sulphuric Acid, *ten milliliters*	10 mils
Sugar, *seven hundred and fifty grammes*	750 Gm.
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the fluidextract of rose and diluted sulphuric acid with *three hundred milliliters* of water and allow the mixture to stand for two hours; then filter and add enough water through the filter to obtain *five hundred and twenty milliliters* of filtrate. Dissolve the sugar in the filtrate by agitation and finally add sufficient water to make the product measure *one thousand milliliters*. Mix thoroughly.

SYRUPUS RUBI

Syrup of Rubus

(U.S.P. VIII)

Syr. Rubi

Fluidextract of Rubus, *two hundred and fifty milliliters* . . .	**250 mils**
Syrup, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix them.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS RUBI FRUCTUS

Syrup of Blackberry Fruit

Syr. Rubi. Fruct.

Fresh, Ripe Blackberries,
Sugar, each, *a sufficient quantity.*

Garble the blackberries, then wash the fruit in a colander with water, drain and crush to a pulp. Strain this pulp, with pressure, and to every *one thousand milliliters* of expressed juice add *two thousand grammes* of sugar. Heat the mixture at once, with stirring, and when the sugar has dissolved continue the heat until the syrup just boils. Strain it while hot into suitable bottles which have been thoroughly cleaned and, just before filling, rinsed with boiling water, and, when the bottles are filled to the neck, immediately insert, to a point at least 5 mm. below the lip of the bottles, well-fitting corks which have been soaked in boiling water. Finally seal the bottles with melted paraffin.

Keep Syrup of Blackberry Fruit in a cool and dark place.

SYRUPUS RUBI IDÆI

Syrup of Raspberry

Syr. Rubi Id.

Fresh, Ripe Raspberries, *any convenient quantity.*
Sugar, *a sufficient quantity.*

Garble the raspberries, wash them with water, drain, and reduce them to a pulp, and let this stand, at a temperature of about 20° C., until a small portion of the filtered juice produces a clear solution with half its volume of alcohol. Then separate the juice by straining with

pressure, heat it just to the boiling point, remove the scum and filter while hot. Add *two hundred grammes* of sugar to every *one hundred milliliters* of filtered juice and agitate the mixture until the sugar is dissolved. Keep the product in well-stoppered bottles in a cool and dark place.

SYRUPUS SANGUINARIÆ

Syrup of Sanguinaria

Syr. Sanguinar. Syrup of Bloodroot

Sanguinaria, in No. 20 powder, *two hundred and twenty-five grammes*	225 Gm.
Acetic Acid, *one hundred and twenty-five milliliters*	125 mils
Sugar, *eight hundred grammes*	800 Gm.
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the acetic acid with *three hundred and seventy-five milliliters* of water, moisten the sanguinaria with a sufficient quantity of this menstruum, and allow it to macerate for two hours. Then pack it in a glass percolator, and percolate in the usual manner, first with the remainder of the menstruum and afterwards with water until the percolate measures *seven hundred and fifty milliliters,* or until the sanguinaria is practically exhausted. Evaporate the percolate, at a moderate heat, to *four hundred and eighty milliliters,* filter, and dissolve the sugar in this filtrate, with the aid of a gentle heat. Finally add sufficient water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

SYRUPUS SENNÆ AROMATICUS

Aromatic Syrup of Senna

Syr. Senn. Arom.

Fluidextract of Senna, *one hundred and twenty-five milliliters*	125.0 mils
Jalap, in No. 40 powder, *fifty grammes*	50.0 Gm.
Rhubarb, in No. 40 powder, *seventeen and five-tenths grammes*	17.5 Gm.
Saigon Cinnamon, in No. 40 powder, *four grammes*	4.0 Gm.
Clove, in No. 40 powder, *four grammes*	4.0 Gm.
Myristica, in No. 40 powder, *two grammes*	2.0 Gm.
Oil of Lemon, *one and five-tenths milliliters*	1.5 mils
Sugar, *five hundred grammes*	500.0 Gm.
Diluted Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the drugs, add the oil of lemon, moisten with sufficient diluted alcohol and, after macerating for twenty-four hours, percolate in the usual manner, using diluted alcohol as the menstruum. Reserve the first *five hundred and fifty milliliters* of the percolate, add the fluidextract of senna, and dissolve the sugar in the liquid with the aid of a gentle heat, but avoiding the loss of alcohol by evaporation. Allow the solution to cool, collect a further portion of the percolate, and add a sufficient quantity of it to the syrup to make the product measure *one thousand milliliters*.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

SYRUPUS SENNÆ COMPOSITUS

Compound Syrup of Senna

Syr. Senn. Co.

Fluidextract of Senna, *one hundred and thirty-five milliliters*	135 mils
Fluidextract of Rhubarb, *thirty-five milliliters*	35 mils
Fluidextract of Frangula, *thirty-five milliliters*	35 mils
Methyl Salicylate, *four milliliters*	4 mils
Alcohol, *sixty-five milliliters*	65 mils
Syrup, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the methyl salicylate in the alcohol, and add this to the mixed fluidextracts. Then add sufficient syrup to make the product measure *one thousand milliliters*, and mix thoroughly.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

SYRUPUS SODII HYPOPHOSPHITIS

Syrup of Sodium Hypophosphite

Syr. Sod. Hypophos.

Sodium Hypophosphite, *thirty-five grammes*	35 Gm.
Hypophosphorous Acid, *two milliliters*	2 mils
Sugar, *eight hundred grammes*	800 Gm.
Distilled Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the sodium hypophosphite in *four hundred and fifty milliliters* of distilled water, add the hypophosphorous acid and filter the solution. Dissolve the sugar in this liquid by agitation and add sufficient distilled water to make the product measure *one thousand milliliters*.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

SYRUPUS STILLINGIÆ COMPOSITUS

Compound Syrup of Stillingia

Syr. Stilling. Co.

Compound Fluidextract of Stillingia, *two hundred and fifty milliliters*	250 mils
Glycerin, *one hundred milliliters*	100 mils
Syrup, *six hundred and fifty milliliters*	650 mils
To make *one thousand milliliters*	1000 mils

Mix the fluidextract with the glycerin, add the syrup and mix well.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA ALOES ET MYRRHÆ

Tincture of Aloes and Myrrh

(U.S.P. VIII)

Tr. Aloe. et. Myrrh.

Aloes, in No. 40 powder, *one hundred grammes*	100 Gm.
Myrrh, in No. 40 powder, *one hundred grammes*	100 Gm.
Glycyrrhiza, in No. 40 powder, *one hundred grammes*	100 Gm.
Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix *seven hundred and fifty milliliters* of alcohol with *two hundred and fifty milliliters* of water. Macerate the aloes, myrrh, and glycyrrhiza in a stoppered container, in a moderately warm place, with *seven hundred and fifty milliliters* of the menstruum, for seven days, with occasional agitation; then filter through purified cotton, or a plain filter, and, when the liquid has drained off completely, pass enough menstruum through the residue to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

TINCTURA AMARA

Bitter Tincture

Tr. Amar. Stomachic Tincture Bitter Stomachic Drops Stomach Drops

Gentian, in No. 40 powder, *sixty grammes*	60 Gm.
Centaury, in No. 40 powder, *sixty grammes*	60 Gm.

Bitter Orange Peel, in No. 40 powder, *sixty grammes*	60 Gm.
Zedoary, in No. 40 powder, *twenty grammes*	20 Gm.
Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Saturate the mixed drugs with the menstruum, and percolate them, in the usual manner, with a mixture of *two volumes* of alcohol and *one volume* of water, until the Tincture measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

TINCTURA ANTIPERIODICA

Antiperiodic Tincture

Tr. Antiperiod.	Warburg's Tincture
Rhubarb, in No. 30 powder, *eight grammes*	8.00 Gm.
Angelica Fruit, in No. 30 powder, *eight grammes*	8.00 Gm.
Inula, in No. 30 powder, *four grammes*	4.00 Gm.
Saffron, in No. 30 powder, *four grammes*	4.00 Gm.
Fennel, in No. 30 powder, *four grammes*	4.00 Gm.
Gentian, in No. 30 powder, *two grammes*	2.00 Gm.
Zedoary, in No. 30 powder, *two grammes*	2.00 Gm.
Cubeb, in No. 30 powder, *two grammes*	2.00 Gm.
Myrrh, in coarse powder, *two grammes*	2.00 Gm.
Camphor, in coarse powder, *two grammes*	2.00 Gm.
Agaric, in No. 30 powder, *two grammes*	2.00 Gm.
Pepper, in No. 30 powder, *thirty-five hundredths of a gramme*	0.35 Gm.
Saigon Cinnamon, in No. 30 powder, *seventy-five hundredths of a gramme*	0.75 Gm.
Ginger, in No. 30 powder, *seventy-five hundredths of a gramme*	0.75 Gm.
Quinine Bisulphate, *twenty grammes*	20.00 Gm.
Extract of Aloes, *seventeen and five-tenths grammes*	17.50 Gm.
Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix alcohol and water in the proportion of *three volumes* of alcohol and *two volumes* of water. Saturate the mixed drugs with the menstruum

and having macerated them for twenty-four hours percolate them, in the usual manner, until the Tincture measures *nine hundred and sixty milliliters*. In this dissolve the quinine bisulphate and extract of aloes by the aid of a gentle heat, and add sufficient menstruum to make the product measure *one thousand milliliters*. Finally filter the Tincture through paper.

Dose—The dosage of Warburg's Tincture depends on the kind used—whether with aloes or without—and the intended purpose, and varies from 4 mils (1 fluidrachm) to 15 mils (4 fluidrachms). The larger quantity is given when Dr. Warburg's original directions are followed for administering the remedy in remittent fevers. These directions were as follows: "One-half ounce to be given alone, without dilution, after the bowels have been evacuated by any convenient purgative, all liquids being withheld. After three hours, another half ounce is to be given."

TINCTURA ANTIPERIODICA SINE ALOE

Antiperiodic Tincture without Aloes

Tr. Antiperiod. s. Aloe Warburg's Tincture without Aloes

Prepare the Tincture as directed under *Tinctura Antiperiodica*, omitting the Extract of Aloes.

Dose—See *Tinctura Antiperiodica*.

TINCTURA AROMATICA

Aromatic Tincture

Tr. Arom.

Saigon Cinnamon, in No. 40 powder, *one hundred grammes*	**100 Gm.**
Jamaica Ginger, in No. 40 powder, *forty grammes*	**40 Gm.**
Galangal, in No. 40 powder, *twenty grammes*	**20 Gm.**
Clove, in No. 20 powder, *twenty grammes*	**20 Gm.**
Cardamom Seed, in No. 20 powder, *twenty grammes*	**20 Gm.**
Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Saturate the mixed drugs with the menstruum, and having macerated them for twenty-four hours percolate them, in the usual manner, with a mixture of *two volumes* of alcohol and *one volume* of water, until the product measures *one thousand milliliters*.

Average dose—Metric, 2 mils—Apothecaries, 30 minims.

TINCTURA BRYONIÆ

Tincture of Bryonia

Tr. Bryon.

Bryonia, in No. 40 powder, *one hundred grammes*	100 Gm.
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Saturate the powder with alcohol and macerate it for twenty-four hours. Then percolate it, in the usual manner, with alcohol until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA CACTI GRANDIFLORI

Tincture of Cactus Grandiflorus

Tr. Cact. Grand.

Cactus Grandiflorus, *five hundred grammes*	500 Gm.
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Cut the cactus grandiflorus and crush it in a mortar, then add *seven hundred milliliters* of alcohol and transfer the mixture to a closed vessel and macerate for seven days with occasional agitation. Express the drug, measure the expressed liquid and set it aside in a closed container. Pack the residue firmly in a percolator and slowly percolate it with alcohol until a sufficient quantity of percolate is obtained and added to the reserved expressed liquid, to make the product measure *one thousand milliliters.* Filter the Tincture and store it in well-stoppered bottles, in a cool place.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

TINCTURA CALENDULÆ

Tincture of Calendula

(U.S.P. VIII)

Tr. Calend.

Calendula, in No. 20 powder, *two hundred grammes*	200 Gm.
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Saturate the powder with alcohol, and after macerating for twenty-four hours, percolate it, in the usual manner, with alcohol until the product measures *one thousand milliliters.*

TINCTURA CAPSICI ET MYRRHÆ

Tincture of Capsicum and Myrrh

Tr. Capsic. et Myrrh. Hot Drops Thomsonian Number Six

Capsicum, in No. 20 powder, *thirty grammes*	30 Gm.
Myrrh, in moderately coarse powder, *one hundred and twenty grammes*	120 Gm.
Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the powders with an equal bulk of clean, fine sand, and percolate them, in the usual manner, with a mixture of *nine volumes* of alcohol and *one volume* of water, until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

TINCTURA CARAMELLIS

Tincture of Caramel

Caramel, *one hundred grammes*	100 Gm.
Alcohol, *two hundred and fifty milliliters*	250 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the caramel in *five hundred milliliters* of water, with the aid of heat if necessary, then add the alcohol and sufficient water to make the product measure *one thousand milliliters.* Finally filter the Tincture.

TINCTURA CIMICIFUGÆ

Tincture of Cimicifuga

(U.S.P. VIII)

Tr. Cimicif.

Cimicifuga, in No. 40 powder, *two hundred grammes*	200 Gm.
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Saturate the powder with alcohol, and, after macerating for twenty-four hours, percolate it, in the usual manner, with alcohol until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA COCCULI INDICI

Tincture of Cocculus Indicus

Tr. Coccul. Ind.

Cocculus Indicus, in No. 30 powder, *one hundred grammes* . .	**100 Gm.**
Diluted Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Saturate the powder with diluted alcohol, and after macerating for six hours, percolate it, in the usual manner, with diluted alcohol until the product measures *one thousand milliliters.*

NOTE—This Tincture is used almost exclusively for external application to destroy parasites.

TINCTURA CROCI

Tincture of Saffron

Tr. Croc.

Saffron, *one hundred grammes*	**100 Gm.**
Diluted Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Saturate the saffron with diluted alcohol, and after macerating for twenty-four hours, percolate it, in the usual manner, with diluted alcohol until the product measures *one thousand milliliters.*

TINCTURA CUBEBÆ

Tincture of Cubeb

Tr. Cubeb.

Cubeb, in No. 30 powder, *two hundred grammes*	**200 Gm.**
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Saturate the powder with alcohol, and after macerating for twenty-four hours, percolate it, in the usual manner, with alcohol until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA DELPHINII

Tincture of Larkspur

Tr. Delphin.

Larkspur Seed, in No. 30 powder, *one hundred grammes* . . .	**100 Gm.**
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Saturate the powder with alcohol, and after macerating for six hours, percolate it, in the usual manner, with alcohol until the product measures *one thousand milliliters.*

NOTE—Tincture of Larkspur is rarely used internally, but is commonly employed externally to destroy parasites.

TINCTURA ERGOTÆ AMMONIATA

Ammoniated Tincture of Ergot

Tr. Ergot. Ammon.

Ergot, in No. 20 powder, *two hundred and fifty grammes* . . .	**250 Gm.**
Ammonia Water, *one hundred milliliters*	**100 mils**
Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix the ammonia water with *six hundred milliliters* of alcohol and *two hundred milliliters* of water. Saturate the powder with this menstruum and after macerating for twenty-four hours, percolate it, in the usual manner, first with the remainder of the above menstruum and afterward with a mixture of *two volumes* of alcohol and *one volume* of water, until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA FERRI CHLORIDI ÆTHEREA

Ethereal Tincture of Ferric Chloride

Tr. Ferr. Chlor. Æth. Bestuscheff's Tincture. Lamotte's Drops

Solution of Ferric Chloride, *sixty milliliters*	**60 mils**
Ether, *two hundred and fifty milliliters*	**250 mils**
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix the solution of ferric chloride with *six hundred and twenty-five milliliters* of alcohol, add the ether, and then enough alcohol to make the product measure *one thousand milliliters.* Pour the Tincture into bottles made of flint glass, which should not be entirely filled, cork them tightly and expose them to the rays of the sun, until the Tincture has been completely decolorized. Then remove the bottles from the sunlight and open them occasionally, until the liquid has again assumed a yellow color. Preserve the Tincture in a cool and dark place.

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

TINCTURA FERRI CITRO-CHLORIDI

Tincture of Ferric Citro-Chloride

Tr. Ferr. Citro-Chlor.

Tasteless Tincture of Ferric Chloride Tasteless Tincture of Iron

Solution of Ferric Chloride, *three hundred and fifty milliliters.*	350 mils
Sodium Citrate, *five hundred grammes*	500 Gm.
Alcohol, *one hundred and fifty milliliters*	150 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the solution of ferric chloride with *one hundred and fifty milliliters* of water, and dissolve the sodium citrate in this mixture with the aid of a gentle heat. Then add the alcohol, and when the solution has become cold add sufficient water to make the product measure *one thousand milliliters.* Set the Tincture aside in a cold place for a few days, so that the excess of saline matter may separate, and then filter.

AVERAGE DOSE—Metric, 0.5 mil—Apothecaries, 8 minims.

TINCTURA FERRI POMATA

Tincture of Ferrated Extract of Apples

Tr. Ferr. Pomat.

Tinctura Ferri Malatis Crudi Tincture of Crude Malate of Iron

Ferrated Extract of Apples, *one hundred grammes*	100 Gm.
Alcohol, *one hundred milliliters*	100 mils
Cinnamon Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the ferrated extract of apples in *seven hundred and fifty milliliters* of cinnamon water, add the alcohol, filter, and pass sufficient cinnamon water through the filter to make the product measure *one thousand milliliters*.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA GALLÆ

Tincture of Nutgall

(Replacing U.S.P. VIII)

Tr. Gall.

Nutgall, in No. 60 powder, *two hundred grammes*	200 Gm.
Glycerin, *one hundred milliliters*	100 mils
Alcohol, *nine hundred milliliters*	900 mils

Triturate the nutgall with the mixed glycerin and alcohol, transfer the mixture to a suitable container, and macerate it in a moderately warm place for seven days with frequent agitation. Finally filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA GUAIACI COMPOSITA

Compound Tincture of Guaiac

Tr. Guaiac. Co. Dewees' Tincture of Guaiac

Guaiac, *one hundred and twenty-five grammes*	125 Gm.
Potassium Carbonate, *six grammes*	6 Gm.
Pimenta, in moderately fine powder, *thirty-two grammes*	32 Gm.
Pumice, in fine powder, *sixty-five grammes*	65 Gm.
Alcohol, *four hundred and thirty-five milliliters*	435 mils
Water, *four hundred and thirty-five milliliters*	435 mils
Diluted Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Triturate the guaiac and potassium carbonate with the pimenta and the pumice, and afterwards with the alcohol, gradually added. Then add the water slowly and triturate the mixture thoroughly. Finally filter and pass sufficient diluted alcohol through the filter to make the product measure *one thousand milliliters*.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA HUMULI

Tincture of Hops

Tr. Humul.

Hops, in No. 40 powder, *two hundred grammes*	**200 Gm.**
Diluted Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Saturate the powder with diluted alcohol, and after macerating for twenty-four hours, percolate it, in the usual manner, with diluted alcohol until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA IGNATIÆ

Tincture of Ignatia

Tr. Ignat.

One hundred milliliters of Tincture of Ignatia yields not less than 0.18 Gm. nor more than 0.22 Gm. of the alkaloids of ignatia.

Ignatia, in No. 60 powder, *one hundred grammes*	**100 Gm.**
Alcohol,	
Water, each, *a sufficient quantity,*	
To make about *one thousand milliliters* . .	**1000 mils**

Mix alcohol and water in the proportion of *eight volumes* of alcohol to *one volume* of water. Moisten the powder with *one hundred milliliters* of this menstruum, and macerate for twenty-four hours; then pack it firmly in a cylindrical percolator, and gradually pour menstruum upon it, until the ignatia is practically exhausted. Reserve the first *eight hundred milliliters* of percolate, evaporate the remainder to *one hundred milliliters* and mix with the reserved portion. Assay 100 mils of this liquid for total alkaloids as directed below, and from the results thus obtained ascertain by calculation the amount of alkaloids in the remainder of the liquid, and add to this sufficient menstruum so that each *one hundred milliliters* of finished Tincture shall contain 0.2 Gm. of the alkaloids of ignatia.

Assay.—Evaporate 100 mils of Tincture of Ignatia on a water bath until it measures about 10 mils, transfer the evaporated liquid to a separator, and proceed as directed in the assay under *Fluidextractum Stramonii,* modifying the process there

given by using 5 mils of ammonia water with a little distilled water, in divided portions, to rinse the dish in which the Tincture was evaporated and by dissolving the residue in 10 mils of tenth-normal sulphuric acid V.S. instead of 5 mils.

Each mil of tenth-normal sulphuric acid V.S. consumed corresponds to 36.4 milligrammes of the alkaloids of ignatia.

AVERAGE DOSE—Metric, 0.6 mil—Apothecaries, 10 minims.

TINCTURA IODI DECOLORATA

Decolorized Tincture of Iodine

Tr. Iod. Decolor.

Iodine, *eighty-three grammes*	**83 Gm.**
Sodium Thiosulphate, *eighty-three grammes*	**83 Gm.**
Water, *one hundred milliliters*	**100 mils**
Stronger Ammonia Water, *sixty-five milliliters*	**65 mils**
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Digest the iodine, sodium thiosulphate and water, at a gentle heat, until complete solution results. Then add *one hundred and twenty-five milliliters* of alcohol and afterwards the stronger ammonia water. Shake the mixture a few minutes until bubbles of gas no longer escape, and the liquid has become colorless with a white precipitate suspended in it. Now cool the mixture, and then add sufficient alcohol to make the product measure *one thousand milliliters.* Place the bottle containing the liquid in a cold place for a few hours and then filter. Preserve the Tincture in a well-stoppered bottle.

TINCTURA IODI FORTIOR

Stronger Tincture of Iodine

Tr. Iod. Fort. Tinctura Iodi, Churchill, N.F. III Churchill's Tincture of Iodine

Iodine, *one hundred and sixty-five grammes*	**165 Gm.**
Potassium Iodide, *thirty-three grammes*	**33 Gm.**
Water, *two hundred and fifty milliliters*	**250 mils**
Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Dissolve the potassium iodide in the water, then add the iodine and *six hundred milliliters* of alcohol, and when all of the iodine is dissolved add sufficient alcohol to make the product measure *one thousand milliliters.*

TINCTURA IPECACUANHÆ ET OPII

Tincture of Ipecac and Opium

(U.S.P. VIII)

Tr. Ipecac. et Opii Tincture of Dover's Powder

Tincture of Deodorized Opium, *one thousand milliliters* . .	1000 mils
Fluidextract of Ipecac, *one hundred milliliters*	100 mils
Diluted Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Evaporate the tincture of deodorized opium in a tared dish on a water bath, until it weighs *seven hundred grammes.* When it has become cold, add to it the fluidextract of ipecac, filter the mixture, and wash the filter with sufficient diluted alcohol to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 0.5 mil—Apothecaries, 8 minims.

TINCTURA JALAPÆ

Tincture of Jalap

Tr. Jalap.

Jalap, in No. 60 powder, *two hundred grammes*	200 Gm.
Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix *two volumes* of alcohol with *one volume* of water and percolate the jalap with this menstruum, in the usual manner, until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA JALAPÆ COMPOSITA

Compound Tincture of Jalap

Tr. Jalap. Co.

Jalap, in No. 60 powder, *one hundred and twenty-five grammes* .	125 Gm.
Resin of Scammony, in No. 60 powder, *thirty grammes* . . .	30 Gm.
Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix *two volumes* of alcohol with *one volume* of water. Triturate the powders with half their weight of clean sand; moisten the mixture with a sufficient quantity of the menstruum, pack it in a percolator, and percolate it with the menstruum, in the usual manner, until the product measures *one thousand milliliters*.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA KINO ET OPII COMPOSITA

Compound Tincture of Kino and Opium

Tr. Kino et Opii Co.

Tinctura Kino Composita, N.F. III Compound Tincture of Kino

Tincture of Kino, *two hundred milliliters*	200.0 mils
Tincture of Opium, *one hundred milliliters*	100.0 mils
Spirit of Camphor, *sixty-five milliliters*	65.0 mils
Oil of Clove, *one and five-tenths milliliters*	1.5 mils
Cochineal, in fine powder, *eight and five-tenths grammes*	8.5 Gm.
Aromatic Spirit of Ammonia, *eight milliliters*	8.0 mils
Diluted Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Triturate the cochineal with the aromatic spirit of ammonia, and gradually add *six hundred and twenty-five milliliters* of diluted alcohol. Then add the two tinctures, the spirit of camphor, and the oil of clove, and sufficient diluted alcohol to make the product measure *one thousand milliliters*. Finally filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA KRAMERIÆ

Tincture of Krameria

(U.S.P. VIII)

Tr. Kramer.

Krameria, in No. 40 powder, *two hundred grammes*	200 Gm.
Diluted Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Saturate the powder with diluted alcohol, and, after macerating for twenty-four hours, percolate it, in the usual manner, with diluted alcohol until the product measures *one thousand milliliters*.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA OPII CROCATA

Tincture of Opium with Saffron

Tr. Opii Crocat. Sydenham's Laudanum Tinctura Opii Crocata P.I.

One hundred milliliters of Tincture of Opium with Saffron yields not less than 0.95 Gm. nor more than 1.05 Gm. of anhydrous morphine.

Granulated Opium, *one hundred grammes*	100 Gm.
Saffron, in No. 20 powder, *twenty-five grammes*	25 Gm.
Saigon Cinnamon, in No. 60 powder, *six grammes*	6 Gm.
Clove, in No. 30 powder, *six grammes*	6 Gm.
Diluted Alcohol, *a sufficient quantity,*	
To make about *one thousand milliliters*	1000 mils

Triturate the drugs in a mortar with an equal bulk of clean sand, then rub them to a smooth paste with a portion of the diluted alcohol and after macerating for two days percolate it, in the usual manner, with diluted alcohol until the product measures *nine hundred milliliters.* Assay 80 mils of this liquid as directed below and, from the result thus obtained, ascertain by calculation the amount of anhydrous morphine in the remainder of the liquid and add to this enough diluted alcohol to make each *one hundred milliliters* of finished Tincture contain 1 Gm. of anhydrous morphine.

Assay.—Evaporate 80 mils of Tincture of Opium with Saffron on a water bath until the alcohol is all removed. Transfer the extract to a 50 mil graduated flask and wash the evaporating dish with sufficient distilled water to make the entire volume exactly 50 mils when cooled to room temperature. Place in a small mortar 4 Gm. of freshly slaked lime (see page 362), add about 10 mils of the opium solution and rub to a smooth paste, then add the remainder of the solution and rinse the flask with exactly 10 mils of distilled water, adding the rinsings to the mortar, and stir frequently during fifteen minutes. Filter through a dry filter, about 10 cm. in diameter, and transfer exactly 30 mils of the filtrate, representing 40 mils of the Tincture, to an Erlenmeyer flask of suitable capacity. To this add 2 mils of alcohol and 15 mils of ether, and, after shaking the mixture, add 1 Gm. of ammonium chloride, stopper the flask and shake it frequently during half an hour, then set it aside in a cool place for twelve hours or over night. Remove the stopper and brush any adhering crystals back into the flask. Decant the ethereal layer into a small funnel, the neck of which has been previously closed with a pledget of purified cotton. Rinse the flask and contents with 15 mils of ether, and, when the ether has passed through, wash the funnel and cotton with a small quantity of ether, and then pour the aqueous liquid into the funnel without trying to remove the crystals. Wash the crystals in the flask and the contents of the funnel with distilled water, previously saturated with morphine, until the washings are colorless. Then add a few drops of distilled water to replace the morphinated water. Incline the edge of the funnel over the mouth of the flask and by means of a glass rod carefully transfer the cotton with adhering crystals to the flask. Insert the funnel into the neck of the flask and wash the funnel with 20 mils of tenth-normal sulphuric acid V.S., followed by 10 mils of distilled water, applied drop by drop around the edge

of the funnel. Remove the funnel, replace the cork, warm gently, and agitate until the crystals are dissolved. Rinse the cork with distilled water and titrate the excess of acid with fiftieth-normal potassium hydroxide V.S., cochineal T.S. or methyl orange T.S. being used as indicator. Each mil of tenth-normal sulphuric acid V.S. consumed corresponds to 0.0285 Gm. of anhydrous morphine.

AVERAGE DOSE—Metric, 0.6 mil—Apothecaries, 10 minims.

TINCTURA PARACOTO

Tincture of Paracoto

Tr. Paracoto Tinctura Coto, N.F. III

Paracoto, in No. 40 powder, *one hundred and twenty-five grammes* . **125 Gm.**
Alcohol, *a sufficient quantity,*

To make *one thousand milliliters* . . . . **1000 mils**

Saturate the powder, in a percolator, with alcohol, and after macerating for twenty-four hours percolate it, in the usual manner, with alcohol until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

TINCTURA PASSIFLORÆ

Tincture of Passion Flower

Tr. Passiflor.

Passion Flower, in No. 20 powder, *two hundred grammes* . . **200 Gm.**
Diluted Alcohol, *a sufficient quantity,*

To make *one thousand milliliters* . . . . . **1000 mils**

Saturate the passion flower with diluted alcohol, and after macerating for twenty-four hours, percolate, in the usual manner, with diluted alcohol until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 0.6 mil—Apothecaries, 10 minims.

TINCTURA PECTORALIS

Pectoral Tincture

Tr. Pectoral. Guttæ Pectorales Pectoral Drops Bateman's Pectoral Drops

Tincture of Opium, *forty-two milliliters* . . . . . **42 mils**
Compound Tincture of Gambir, *sixty-four milliliters* . . . **64 mils**
Spirit of Camphor, *forty milliliters* . . . . . **40 mils**

Oil of Anise, *one milliliter*	**1 mil**
Caramel, *sixteen grammes*	**16 Gm.**
Diluted Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix the several ingredients with sufficient diluted alcohol to make the product measure *one thousand milliliters*, and filter.

AVERAGE DOSE—Infants, Metric, 0.6 mil—Apothecaries, 10 minims.

TINCTURA PERSIONIS

Tincture of Cudbear

Tr. Persion.

Cudbear, in fine powder, *one hundred grammes*	**100 Gm.**
Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Place the cudbear in a suitable percolator, and percolate it with a mixture of *three volumes* of alcohol and *one volume* of water until the product measures *one thousand milliliters.*

TINCTURA PERSIONIS COMPOSITA

Compound Tincture of Cudbear

Tr. Persion. Co.

Cudbear, in fine powder, *fifteen grammes*	**15 Gm.**
Caramel, *one hundred grammes*	**100 Gm.**
Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix *one volume* of alcohol with *two volumes* of water and macerate the cudbear with *seven hundred and fifty milliliters* of this solvent, during twelve hours, agitating occasionally. Then filter, add the caramel, previously dissolved in *one hundred and twenty-five milliliters* of the solvent, and finally pass enough of the solvent through the filter to make the product measure *one thousand milliliters.*

TINCTURA PIMPINELLÆ

Tincture of Pimpinella

Tr. Pimpinel.

Pimpinella, in No. 40 powder, *two hundred grammes*	**200 Gm.**
Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix *two volumes* of alcohol with *one volume* of water. Saturate the powder with the menstruum and, after macerating for twelve hours, percolate it, in the usual manner, using menstruum of the same strength, until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA PULSATILLÆ

Tincture of Pulsatilla

Tr. Pulsatil.

Pulsatilla, in No. 30 powder, *one hundred grammes*	**100 Gm.**
Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix *three volumes* of alcohol with *one volume* of water. Saturate the powder with the menstruum and, after macerating for six hours, percolate it, in the usual manner, using menstruum of the same strength, until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

TINCTURA QUILLAJÆ

Tincture of Quillaja

(U.S.P. VIII)

Tr. Quillaj.

Quillaja, in No. 20 powder, *two hundred grammes*	**200 Gm.**
Alcohol, *three hundred and fifty milliliters*	**350 mils**
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Boil the quillaja in a covered vessel with *eight hundred milliliters* of water for fifteen minutes, strain while hot, and wash the residue on the

strainer with *two hundred milliliters* of boiling water. Then evaporate the strained liquid to *six hundred milliliters,* allow it to cool, add the alcohol, and set it aside for twelve hours. Decant the supernatant liquid, filter it, then pour the residue on the filter, and, when the liquid ceases to drop, wash the filter with sufficient water to make the product measure *one thousand milliliters.*

TINCTURA RHEI AQUOSA

Aqueous Tincture of Rhubarb

Tr. Rhei Aq.

Rhubarb, *one hundred grammes*	100 Gm.
Potassium Carbonate, *ten grammes*	10 Gm.
Cinnamon Water, *one hundred and twenty-five milliliters*	125 mils
Alcohol, *one hundred and ten milliliters*	110 mils
Water, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the potassium carbonate in *seven hundred and fifty milliliters* of water, and macerate the rhubarb in this solution during twenty-four hours, having first cut it into thin slices and carefully freed it from any adhering fine powder. Strain this mixture through muslin, heat the strained liquid to boiling, add the cinnamon water and alcohol, stir it well and, while warm, filter it in a covered funnel. To the cold filtrate add sufficient water to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA RHEI DULCIS

Sweet Tincture of Rhubarb

Tr. Rhei Dulc.

Rhubarb, in No. 40 powder, *one hundred grammes*	100 Gm.
Glycyrrhiza, in No. 40 powder, *forty grammes*	40 Gm.
Anise, in No. 20 powder, *forty grammes*	40 Gm.
Cardamom Seed, in No. 20 powder, *ten grammes*	10 Gm.
Glycerin, *one hundred milliliters*	100 mils
Alcohol,	
Water,	
Diluted Alcohol, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the glycerin with *five hundred milliliters* of alcohol and *four hundred milliliters* of water. Saturate the mixed powders with sufficient of this menstruum, and macerate them for twenty-four hours; then percolate them in the usual manner, first with the above glycerinated menstruum and afterwards with sufficient diluted alcohol to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

TINCTURA RHEI ET GENTIANÆ

Tincture of Rhubarb and Gentian

Tr. Rhei et Gent.

Rhubarb, in No. 40 powder, *seventy grammes*	70.0 Gm.
Gentian, in No. 40 powder, *seventeen and five-tenths grammes*	17.5 Gm.
Diluted Alcohol, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Saturate the mixed powders with sufficient diluted alcohol and macerate for six hours; then percolate in the usual manner, with diluted alcohol until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA SABAL ET SANTALI

Tincture of Saw Palmetto and Santal

Tr. Sabal. et Santal.

Sabal, in about No. 16 powder, *two hundred grammes*	200 Gm.
Sandal Wood, in No. 60 powder, *sixty-five grammes*	65 Gm.
Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix *four volumes* of alcohol with *one volume* of water, and saturate the drugs with this menstruum. After macerating for two days, percolate them in the usual manner with sufficient menstruum of the same strength until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA SERPENTARIÆ

Tincture of Serpentaria

(U.S.P. VIII)

Tr. Serpent.

Serpentaria, in No. 50 powder, *two hundred grammes*	**200 Gm.**
Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix *two volumes* of alcohol with *one volume* of water. Saturate the powder with this menstruum, and after macerating for twenty-four hours, percolate it in the usual manner with sufficient menstruum of the same strength until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA SUMBUL

Tincture of Sumbul

Tr. Sumbul

Sumbul, in No. 30 powder, *one hundred grammes*	**100 Gm.**
Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix *two volumes* of alcohol with *one volume* of water. Saturate the powder with this menstruum, and, after macerating for twenty-four hours, percolate it in the usual manner with sufficient menstruum of the same strength until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA VANILLÆ

Tincture of Vanilla

(U.S.P. VIII)

Tr. Vanill.

Vanilla, cut into small pieces, *one hundred grammes*	**100 Gm.**
Sugar, in coarse granules, *two hundred grammes*	**200 Gm.**
Alcohol,	
Diluted Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Macerate the vanilla with *five hundred milliliters* of alcohol in a stoppered container, in a moderately warm place, for two days, with frequent agitation; then transfer it to a plain filter and reserve the filtered liquid. Spread out the drug on the filter and expose it to the air until all of the alcohol has evaporated. Then grind the vanilla and sugar to a uniform powder, pack this in a percolator and slowly percolate it with a mixture of the reserved filtrate and an *equal volume* of water. When the liquid ceases to drop, continue the percolation slowly, gradually adding the remainder of the prepared menstruum and then sufficient diluted alcohol to make the product measure *one thousand milliliters.*

TINCTURA VIBURNI OPULI COMPOSITA

Compound Tincture of Viburnum

Tr. Viburn. Opul. Co.

Viburnum Opulus, in No. 40 powder, *thirty-five grammes* . .	**35 Gm.**
Dioscorea, in No. 40 powder, *thirty-five grammes*	**35 Gm.**
Scutellaria, in No. 40 powder, *ten grammes*	**10 Gm.**
Clove, in No. 20 powder, *fifty grammes*	**50 Gm.**
Saigon Cinnamon, in No. 40 powder, *sixty-five grammes* . . .	**65 Gm.**
Glycerin, *seventy-five milliliters*	**75 mils**
Alcohol,	
Water, each, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix the glycerin with *seven hundred and fifty milliliters* of alcohol and *one hundred and seventy-five milliliters* of water. Saturate the powders with this menstruum and, after macerating for forty-eight hours, percolate them in the usual manner, first with the above menstruum, then with a mixture of *three volumes* of alcohol and *one volume* of water, until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURA ZEDOARIÆ AMARA

Bitter Tincture of Zedoary

Tr. Zedoar. Amar. Compound Tincture of Zedoary

Zedoary, in No. 40 powder, *two hundred and fifty grammes* . .	**250 Gm.**
Aloes, in fine powder, *one hundred and twenty-five grammes* . .	**125 Gm.**
Rhubarb, in No. 40 powder, *sixty-two grammes*	**62 Gm.**
Gentian, in No. 40 powder, *sixty-two grammes*	**62 Gm.**
Agaric, in No. 40 powder, *sixty-two grammes*	**62 Gm.**

Saffron, in No. 40 powder, *sixty-two grammes* . . . . . 62 Gm.
Glycerin, *one hundred and twenty-five milliliters* . . . . . 125 mils
Alcohol,
Water, each, *a sufficient quantity,*
To make *one thousand milliliters* . . . . . 1000 mils

Mix *two volumes* of alcohol with *one volume* of water. Saturate the mixed drugs with the above menstruum and percolate in the usual manner, with this menstruum, until the product measures *seven hundred and fifty milliliters.* Add to this the glycerin and set it aside. Then continue the percolation until the drugs are practically exhausted, evaporate the last percolate to about *one hundred and twenty milliliters,* mix it with the reserved portion, and then add sufficient menstruum to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

TINCTURÆ ÆTHEREÆ

Ethereal Tinctures

Ethereal Tinctures, when not otherwise directed, are to be prepared according to the following general formula:

The Drug, properly comminuted, *one hundred grammes* . . . . 100 Gm.
Alcohol,
Ether, each, *a sufficient quantity,*
To make *one thousand milliliters* . . . . . 1000 mils

Percolate the drug in the usual manner, but with proper precautions to avoid loss of menstruum by evaporation, with a mixture of *one volume* of ether, and *two volumes* of alcohol, until the product measures *one thousand milliliters.*

TINCTURÆ MEDICAMENTORUM RECENTIUM

Tinctures of Fresh Drugs

Tincturæ Herbarum Recentium, U.S.P. VIII

Tinctures of fresh drugs, when not otherwise directed, are to be prepared according to the following general formula:

The Fresh Drug, cut, bruised, or crushed, *five hundred grammes* 500 Gm.
Alcohol, *one thousand milliliters* . . . . . 1000 mils

Macerate the drug with the alcohol in a closed vessel in a moderately warm place during fourteen days, with occasional stirring; then strongly express the liquid and filter it through paper.

TROCHISCI CARBONIS LIGNI

Troches of Charcoal

Troch. Carb. Lig.

Wood Charcoal, in No. 100 powder, *thirty grammes*	30.0 Gm.
Tragacanth, in fine powder, *four grammes*	4.0 Gm.
Sugar, in fine powder, *sixty-six grammes*	66.0 Gm.
Vanillin, *three-tenths of a gramme*	0.3 Gm.
Water, *a sufficient quantity,*	
To make *one hundred troches*	100

Triturate the vanillin with *twenty grammes* of sugar until reduced to a fine powder, add the remainder of the sugar and the other ingredients, mix thoroughly, and form a mass with water. Divide this into *one hundred troches* and dry them in a current of warm air.

AVERAGE DOSE—1 troche.

TROCHISCI GAMBIR

Troches of Gambir

(U.S.P. VIII)

Troch. Gambir

Gambir, in fine powder, *six grammes*	6.0 Gm.
Tragacanth, in fine powder, *three grammes*	3.0 Gm.
Sugar, in fine powder, *ninety-one grammes*	91.0 Gm.
Oil of Cinnamon, *two-tenths of a milliliter*	0.2 mil
Water, *a sufficient quantity,*	
To make *one hundred troches*	100

Rub the powders together until well mixed; then incorporate the oil, and form a mass with water. Divide this into *one hundred troches* and dry them in a current of warm air.

AVERAGE DOSE—1 troche.

TROCHISCI MENTHÆ PIPERITÆ

Troches of Peppermint

Troch. Menth. Pip.

Oil of Peppermint, *one milliliter*	1 mil
Sugar, in fine powder, *one hundred grammes*	100 Gm.
Mucilage of Tragacanth, *a sufficient quantity,*	
To make *one hundred troches*	100

Triturate the oil of peppermint and the sugar together until they are thoroughly mixed; then form a mass with mucilage of tragacanth, and divide it into *one hundred troches*. Dry them in a current of warm air.

AVERAGE DOSE—1 troche.

TROCHISCI PHENOLPHTHALEINI

Troches of Phenolphthalein

Troch. Phenolphthal.

Phenolphthalein, in fine powder, *six grammes*	6.0 Gm.
Acacia, in fine powder, *ten grammes*	10.0 Gm.
Sugar, in fine powder, *eighty-four grammes*	84.0 Gm.
Vanillin, *three-tenths of a gramme*	0.3 Gm.
Carmine, *one-tenth of a gramme*	0.1 Gm.
Water, *a sufficient quantity,*	
To make *one hundred troches*	100

Triturate the carmine and vanillin with *twenty grammes* of sugar until uniformly mixed, then add the remainder of the sugar and the other ingredients, mix thoroughly and form a mass with water. Divide this into *one hundred troches*, and dry them in a current of warm air.

AVERAGE DOSE—1 troche.

TROCHISCI QUININÆ TANNATIS

Troches of Quinine Tannate

Troch. Quin. Tan.

Quinine Tannate, *six grammes*	6.0 Gm.
Tragacanth, in fine powder, *three grammes*	3.0 Gm.
Oil of Theobroma, *five grammes*	5.0 Gm.
Cocoa, in fine powder, *twenty-five grammes*	25.0 Gm.
Sugar, in fine powder, *sixty grammes*	60.0 Gm.
Vanillin, *three-tenths of a gramme*	0.3 Gm.
Sodium Benzosulphinide, *two-tenths of a gramme*	0.2 Gm.
Chloroform,	
Water, each, *a sufficient quantity,*	
To make *one hundred troches*	100

Triturate the sodium benzosulphinide and the vanillin with *twenty grammes* of sugar until uniformly mixed, add the remainder of the sugar,

the tragacanth and cocoa and mix thoroughly. Triturate the quinine tannate and the oil of theobroma in a mortar with sufficient chloroform to produce a thin paste, set it aside until the chloroform has evaporated, then incorporate the powdered ingredients, and form a mass with water. Divide this into *one hundred troches* and dry them in a current of warm air.

AVERAGE DOSE—1 troche.

TROCHISCI SANTONINI

Troches of Santonin

(Replacing U.S.P. VIII)

Troch. Santonin.

Santonin, in fine powder, *three grammes*	**3.0 Gm.**
Tragacanth, in fine powder, *three grammes*	**3.0 Gm.**
Sugar, in fine powder, *fifty-four grammes*	**54.0 Gm.**
Cocoa, in fine powder, *forty grammes*	**40.0 Gm.**
Vanillin, in fine powder, *one-tenth of a gramme*	**0.1 Gm.**
Water, *a sufficient quantity,*	
To make *one hundred troches*	**100**

Triturate the vanillin with the santonin and tragacanth until they are thoroughly mixed; then uniformly incorporate the other powders and form a mass with water. Divide this into *one hundred troches* and dry them in a current of warm air.

AVERAGE DOSE—1 troche.

TROCHISCI SANTONINI COMPOSITI

Compound Troches of Santonin

Troch. Santonin. Co. Troches of Santonin and Calomel

Santonin, in fine powder, *three grammes*	**3.0 Gm.**
Mild Mercurous Chloride, *three grammes*	**3.0 Gm.**
Tragacanth, in fine powder, *three grammes*	**3.0 Gm.**
Sugar, in fine powder, *fifty-one grammes*	**51.0 Gm.**
Cocoa, in fine powder, *forty grammes*	**40.0 Gm.**
Vanillin, *one-tenth of a gramme*	**0.1 Gm.**
Water, *a sufficient quantity,*	
To make *one hundred troches*	**100**

Triturate the vanillin, santonin and mild mercurous chloride with *twenty grammes* of sugar until uniformly mixed, then add the remainder of the sugar and the other ingredients, mix thoroughly and form a mass with water. Divide this into *one hundred troches* and dry them in a current of warm air.

AVERAGE DOSE—1 troche.

TROCHISCI SULPHURIS ET POTASSII BITARTRATIS

Troches of Sulphur and Potassium Bitartrate

Troch. Sulphur et Pot. Bitart.

Troches of Sulphur and Cream of Tartar

Washed Sulphur, *thirty grammes*	30.0 Gm.
Potassium Bitartrate, *six grammes*	6.0 Gm.
Tragacanth, in fine powder, *four grammes*	4.0 Gm.
Sugar, in fine powder, *sixty grammes*	60.0 Gm.
Oil of Orange, *five-tenths of a milliliter*	0.5 mil
Water, *a sufficient quantity,*	
To make *one hundred troches*	100

Triturate the powdered ingredients together until uniformly mixed, then incorporate the oil and form a mass with water. Divide this into *one hundred troches* and dry them in a current of warm air.

AVERAGE DOSE—1 troche.

TROCHISCI ULMI

Troches of Elm

Troch. Ulmi

Elm, in No. 80 powder, *twenty grammes*	20.0 Gm.
Tragacanth, in fine powder, *one gramme*	1.0 Gm.
Sugar, in fine powder, *seventy-nine grammes*	79.0 Gm.
Methyl Salicylate, *two-tenths of a milliliter*	0.2 mil
Water, *a sufficient quantity,*	
To make *one hundred troches*	100

Triturate the powdered ingredients together until uniformly mixed, then incorporate the oil and form a mass with water. Divide this into *one hundred troches* and dry them in a current of warm air.

AVERAGE DOSE—1 troche.

UNGUENTUM CALAMINÆ

Calamine Ointment

Ung. Calamin.

Unguentum Zinci Carbonatis Crudi Unguentum Calaminare Turner's Cerate

Prepared Calamine, *seventeen grammes*	17 Gm.
Ointment, *eighty-three grammes*	83 Gm.
To make *one hundred grammes*	100 Gm.

Mix the prepared calamine intimately with the ointment, by trituration, so as to produce a smooth and homogeneous product.

UNGUENTUM CAMPHORÆ

Camphor Ointment

Ung. Camph.

Camphor, in coarse powder, *twenty-two grammes*	22 Gm.
White Wax, *eleven grammes*	11 Gm.
Lard, *sixty-seven grammes*	67 Gm.
To make *one hundred grammes*	100 Gm.

Melt the white wax and lard with a gentle heat, then dissolve the camphor in the melted mixture without further heating and stir the ointment until it is cold.

UNGUENTUM FUSCUM

Brown Ointment

Ung. Fusc. Unguentum Matris Mother's Salve

Camphorated Brown Plaster, *fifty grammes*	50 Gm.
Olive Oil, *twenty-five grammes*	25 Gm.
Prepared Suet, *twenty-five grammes*	25 Gm.
To make *one hundred grammes*	100 Gm.

Melt together the several ingredients and stir the ointment until it is cold.

UNGUENTUM HYDRARGYRI OXIDI RUBRI

Ointment of Red Mercuric Oxide

(U.S.P. VIII)

Ung. Hydrarg. Oxid. Rub.

Red Mercuric Oxide, in very fine powder, *ten grammes*	10 Gm.
Water, *ten milliliters*	10 mils
Hydrous Wool Fat, *forty grammes*	40 Gm.
Petrolatum, *forty grammes*	40 Gm.
To make *one hundred grammes*	100 Gm.

Triturate the red mercuric oxide with the water until the mixture is smooth and absolutely free from gritty particles, then add the hydrous wool fat in divided portions, and incorporate thoroughly with the petrolatum. *Contact with metallic utensils should be avoided.*

UNGUENTUM PICIS COMPOSITUM

Compound Tar Ointment

Ung. Pic. Co.

Rectified Oil of Tar, *four grammes*	4 Gm.
Tincture of Benzoin, *two grammes*	2 Gm.
Zinc Oxide, *three grammes*	3 Gm.
Yellow Wax, *twenty-five grammes*	25 Gm.
Lard, *thirty-two grammes*	32 Gm.
Cottonseed Oil, *thirty-four grammes*	34 Gm.
To make *one hundred grammes*	100 Gm.

Melt the yellow wax and lard with the cottonseed oil at a gentle heat, and add the tincture of benzoin. Then withdraw the heat, add the rectified oil of tar, and finally the zinc oxide, and incorporate the latter thoroughly, so that, on cooling, a smooth, homogeneous ointment results.

UNGUENTUM PLUMBI IODIDI

Ointment of Lead Iodide

Ung. Plumb. Iod.

Lead Iodide, in very fine powder, *ten grammes*	10 Gm.
Benzoinated Lard, *ninety grammes*	90 Gm.
To make *one hundred grammes*	100 Gm.

Rub the lead iodide with the benzoinated lard, gradually added, until they are thoroughly mixed.

UNGUENTUM POTASSII IODIDI

Ointment of Potassium Iodide

(Replacing U.S.P. VIII)

Ung. Pot. Iod.

Potassium Iodide, *ten grammes*	10 Gm.
Sodium Thiosulphate, *one gramme*	1 Gm.
Water, *nine grammes*	9 Gm.
Benzoinated Lard, *eighty grammes*	80 Gm.
To make *one hundred grammes*	100 Gm.

Dissolve the potassium iodide and sodium thiosulphate in the water, then add the benzoinated lard and incorporate thoroughly. This ointment should not be dispensed unless it has been freshly prepared.

UNGUENTUM RESORCINOLIS COMPOSITUM

Compound Resorcinol Ointment

Ung. Resorcin. Co. Unguentum Resorcini Compositum, N.F. III

Resorcinol, *six grammes*	6 Gm.
Zinc Oxide, *six grammes*	6 Gm.
Bismuth Subnitrate, *six grammes*	6 Gm.
Rectified Oil of Birch Tar, *six grammes*	6 Gm.
Yellow Wax, *ten grammes*	10 Gm.
Petrolatum, *twenty-five grammes*	25 Gm.
Wool Fat, *twenty-eight grammes*	28 Gm.
Glycerin, *thirteen grammes*	13 Gm.
To make *one hundred grammes*	100 Gm.

Melt the yellow wax and anhydrous wool fat in a dish on a water bath. Rub the zinc oxide and bismuth subnitrate with the petrolatum until smooth and add it to the melted mixture. Dissolve the resorcinol in the glycerin, incorporate the solution with the warm mixture just prepared, then add the oil and stir the ointment until it is cold.

UNGUENTUM SULPHURIS ALKALINUM

Alkaline Sulphur Ointment

Ung. Sulphur. Alk.

Sublimed Sulphur, *twenty grammes*	20 Gm.
Potassium Carbonate, *ten grammes*	10 Gm.

Water, *five milliliters*	5 mils
Benzoinated Lard, *sixty-five grammes*	65 Gm.
To make *one hundred grammes*	100 Gm.

Rub the sulphur with the potassium carbonate and the water, until a smooth, homogeneous mixture results, then gradually add the benzoinated lard, and mix thoroughly.

UNGUENTUM SULPHURIS COMPOSITUM

Compound Sulphur Ointment

Ung. Sulphur. Co. Wilkinson's Ointment Hebra's Itch Ointment

Precipitated Calcium Carbonate, *ten grammes*	10 Gm.
Sublimed Sulphur, *fifteen grammes*	15 Gm.
Oil of Cade, *fifteen grammes*	15 Gm.
Soft Soap, *thirty grammes*	30 Gm.
Lard, *thirty grammes*	30 Gm.
To make *one hundred grammes*	100 Gm.

Mix the lard with the soft soap and oil of cade, then gradually incorporate the sublimed sulphur and precipitated calcium carbonate and rub the ointment until it is smooth.

UNGUENTUM VERATRINÆ

Veratrine Ointment

(U.S P. VIII)

Ung. Veratrin.

Veratrine, *four grammes*	4 Gm.
Expressed Oil of Almond, *six grammes*	6 Gm.
Benzoinated Lard, *ninety grammes*	90 Gm.
To make *one hundred grammes*	100 Gm.

Rub the veratrine with the expressed oil of almond, then gradually add the benzoinated lard, and mix thoroughly.

UNGUENTUM ZINCI STEARATIS

Ointment of Zinc Stearate

(U.S.P. VIII)

Ung. Zinc. Stear.

Zinc Stearate, in fine powder, *fifty grammes*	50 Gm.
White Petrolatum, *fifty grammes*	50 Gm.
To make *one hundred grammes*	100 Gm.

Rub the zinc stearate with the white petrolatum until a smooth ointment is produced.

VINUM ANTIMONII

Wine of Antimony

(Replacing U.S.P. VIII)

Vin. Antimon.

Antimony and Potassium Tartrate, *four grammes*	4 Gm.
Boiling Distilled Water, *twenty-five milliliters*	25 mils
Sherry Wine, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the antimony and potassium tartrate in the boiling distilled water. Add this solution to *seven hundred and twenty-five milliliters* of sherry wine; mix well, and allow the mixture to stand until it has cooled. Then add sufficient sherry wine to make the product measure *one thousand milliliters,* and filter.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

VINUM AURANTII COMPOSITUM

Compound Wine of Orange

Vin. Aurant. Co. Elixir Aurantiorum Compositum Compound Elixir of Orange

Bitter Orange Peel, in No. 40 powder, *two hundred grammes*	200 Gm.
Absinthium, in No. 40 powder, *sixty-five grammes*	65 Gm.
Menyanthes, in No. 40 powder. *sixty-five grammes*	65 Gm.
Cascarilla, in No. 40 powder, *sixty-five grammes*	65 Gm.
Saigon Cinnamon, in No. 40 powder, *forty-three grammes*	43 Gm.
Gentian, in No. 40 powder, *forty-three grammes*	43 Gm.
Potassium Carbonate, *ten grammes*	10 Gm.
Sherry Wine, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the vegetable drugs with the potassium carbonate, saturate the mixture with sherry wine and allow it to macerate during twenty-four hours. Then percolate with sherry wine, in the usual manner, until the product measures *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

VINUM CARNIS

Wine of Beef

Vin. Carn.	Beef and Wine
Extract of Beef, *thirty grammes*	30 Gm.
Water, hot, *sixty milliliters*	60 mils
Syrup, *one hundred milliliters*	100 mils
Alcohol, *fifty milliliters*	50 mils
Compound Spirit of Orange, *one milliliter*	1 mil
Sherry Wine, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the extract of beef in the hot water, add the syrup, then the compound spirit of orange and the alcohol, previously mixed, and sufficient sherry wine to make the product measure *one thousand milliliters.* Set the preparation aside for two days, and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

VINUM CARNIS ET FERRI

Wine of Beef and Iron

Vin. Carn. et Ferr.	Beef, Wine and Iron
Extract of Beef, *thirty grammes*	30 Gm.
Water, hot, *sixty milliliters*	60 mils
Iron and Ammonium Citrate, *ten grammes*	10 Gm.
Syrup, *one hundred milliliters*	100 mils
Alcohol, *fifty milliliters*	50 mils
Compound Spirit of Orange, *one milliliter*	1 mil
Ammonia Water,	
Sherry Wine, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the extract of beef in the hot water, add the syrup, then the compound spirit of orange and the alcohol, previously mixed. Dissolve the iron and ammonium citrate in *seven hundred and fifty milli-*

liters of sherry wine, add this solution to the mixture just prepared, render the resulting product neutral or very faintly alkaline to litmus by the addition of ammonia water, and then add enough sherry wine to make the product measure *one thousand milliliters*. If the liquid is now acid to litmus, add ammonia water, drop by drop, until it is again neutral or very faintly alkaline. Set the preparation aside for two days, and filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

VINUM COLCHICI CORMI

Wine of Colchicum Corm

Vin. Colchic. Corm. Vinum Colchici Radicis, N.F. III

One hundred milliliters of Wine of Colchicum Corm yields not less than 0.126 Gm. nor more than 0.154 Gm. of colchicine.

Colchicum Corm, in No. 30 powder, *four hundred grammes*	**400 Gm.**
Alcohol, *one hundred and fifty milliliters*	**150 mils**
Sherry Wine, *a sufficient quantity,*	
To make about *one thousand milliliters*	**1000 mils**

Mix the alcohol with *eight hundred and fifty milliliters* of sherry wine. Moisten the powder with *one hundred milliliters* of the menstruum, pack it moderately in a conical percolator, and gradually pour upon it, first, the remainder of the menstruum, and afterwards enough sherry wine to make the product measure *nine hundred milliliters*. Assay 40 mils of the liquid, as directed below, and from the result thus obtained ascertain by calculation the amount of colchicine in the remainder of the liquid, and adjust this so that each *one hundred milliliters* of the Wine contains 0.14 Gm. of colchicine.

Assay.—Evaporate 40 mils of Wine of Colchicum Corm to 15 mils and proceed as directed under *Fluidextractum Colchici Cormi*, rinsing the dish with a portion of the water there directed.

AVERAGE DOSE—Metric, 0.6 mil—Apothecaries, 10 minims.

VINUM COLCHICI SEMINIS

Wine of Colchicum Seed

(U.S.P. VIII)

Vin. Colch. Sem.

One hundred milliliters of Wine of Colchicum Seed yields not less than 0.036 Gm. nor more than 0.044 Gm. of colchicine.

Fluidextract of Colchicum Seed, *one hundred milliliters* . .	100 mils
Alcohol, *one hundred and fifty milliliters*	150 mils
Sherry Wine, *seven hundred and fifty milliliters*	750 mils
To make *one thousand milliliters*	1000 mils

Mix them. Set the mixture aside for two days and then filter.

Assay.—Evaporate 150 mils of Wine of Colchicum Seed to 15 mils and proceed as directed under *Fluidextractum Colchici Cormi.*

AVERAGE DOSE—Metric, 2 mils—Apothecaries, 30 minims.

VINUM FERRI

Wine of Iron

(U.S.P. VIII)

Vin. Ferr. Wine of Citrate of Iron

Iron and Ammonium Citrate, *forty grammes*	40 Gm.
Tincture of Sweet Orange Peel, *sixty milliliters*	60 mils
Syrup, *one hundred milliliters*	100 mils
Sherry Wine, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the iron and ammonium citrate in *seven hundred milliliters* of sherry wine. Add to this the tincture of sweet orange peel and the syrup, and, lastly, enough sherry wine to make the product measure *one thousand milliliters.* Set the mixture aside for two days and then filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

VINUM FERRI AMARUM

Bitter Wine of Iron

(U.S.P. VIII)

Vin. Ferr. Amar.

Iron and Quinine Citrate, *fifty grammes*	50 Gm.
Tincture of Sweet Orange Peel, *sixty milliliters*	60 mils
Syrup, *three hundred milliliters*	300 mils
Sherry Wine, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Dissolve the iron and quinine citrate in *five hundred milliliters* of sherry wine. Add to this the tincture of sweet orange peel and the syrup, and, lastly, sufficient sherry wine to make the product measure *one thousand milliliters.* Set the mixture aside for two days and then filter.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

VINUM FRAXINI

Wine of White Ash

Vin. Frax. Vinum Fraxini Americanæ, N.F. III

White Ash Bark, in No. 40 powder, *five hundred grammes* . . .	**500 Gm.**
Alcohol,	
Sherry Wine, each, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Mix *one hundred and twenty-five milliliters* of alcohol with *eight hundred and seventy-five milliliters* of sherry wine and macerate the bark in *seven hundred and fifty milliliters* of the mixture in a covered vessel, during three days, then transfer it to a percolator and allow the liquid to drain off. When completely drained, pack the residue firmly, and gradually pour on sufficient menstruum of the same kind until the product measures *one thousand milliliters.* Filter the Wine and keep it in well-stoppered bottles, which should be completely filled, and stored in a cool place.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

VINUM IPECACUANHÆ

Wine of Ipecac

(U.S.P. VIII)

Vin. Ipecac.

One hundred milliliters of Wine of Ipecac yields not less than 0.180 Gm. nor more than 0.220 Gm. of the alkaloids from ipecac.

Fluidextract of Ipecac, *one hundred milliliters*	**100 mils**
Alcohol, *one hundred milliliters*	**100 mils**
Sherry Wine, *eight hundred milliliters*	**800 mils**
To make *one thousand milliliters*	**1000 mils**

Mix them. Set the mixture aside for two days and then filter through paper in a well-covered funnel.

Assay.—Evaporate 100 mils of Wine of Ipecac to 10 mils, add 10 Gm. of purified sawdust (see page 362), and evaporate it to dryness at a temperature not exceeding 80° C. Transfer the impregnated sawdust to a 250 mil flask and add 100 mils of ether. Rinse the dish in which the mixture was evaporated with 6 mils of ammonia water, previously diluted with an equal volume of distilled water, used in several portions, and add the rinsings to the flask. Stopper the flask and shake it vigorously every few minutes during two hours. Now add 15 mils of distilled water, again shake the flask well and, when the sawdust has subsided, decant 50 mils of the ether

solution, representing 50 mils of the Wine. Completely extract the alkaloids from this solution by shaking out with weak sulphuric acid. Collect the acid washings in a separator; add ammonia water until the solution is decidedly alkaline to litmus and completely extract the alkaloids by shaking out repeatedly with ether. Evaporate the combined ether washings to dryness, dissolve the alkaloid from the residue in exactly 10 mils of tenth-normal sulphuric acid V.S. and titrate the excess of acid with fiftieth-normal potassium hydroxide V.S., cochineal T.S. or methyl red T.S. being used as indicator.

Each mil of tenth-normal sulphuric acid V.S. consumed corresponds to 24 milligrammes of the ether-soluble alkaloids of ipecac.

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

VINUM PEPSINI

Wine of Pepsin

Vin. Pepsin. Pepsin Wine

Glycerite of Pepsin, *two hundred milliliters*	200 mils
Alcohol, *one hundred milliliters*	100 mils
Sherry Wine, *seven hundred milliliters*	700 mils
To make *one thousand milliliters*	1000 mils

Mix the alcohol with sherry wine, then add the glycerite, and mix thoroughly. This preparation should not be dispensed unless it has been recently prepared.

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

VINUM PICIS

Wine of Tar

Vin. Pic.

Tar, *one hundred grammes*	100 Gm.
Water, *two hundred and fifty milliliters*	250 mils
Pumice, in moderately fine powder, *one hundred and twenty-five grammes*	125 Gm.
Alcohol,	
Sherry Wine, each, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Upon the tar, contained in a suitable vessel, pour *two hundred and fifty milliliters* of cold water, and stir the mixture thoroughly; then pour off the water and throw it away. Mix the washed tar thoroughly with the powdered pumice, and add *one thousand milliliters* of a mixture of *one hundred and twenty-five milliliters* of alcohol and *eight hundred and seventy-five milliliters* of sherry wine. Stir the mixture frequently during four hours, then transfer it to a wetted filter, and, after the magma has

drained, pour on a sufficient quantity of the alcohol and wine mixture, prepared as before, to make the filtrate measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 8 mils—Apothecaries, 2 fluidrachms.

VINUM PRUNI VIRGINIANÆ

Wine of Wild Cherry

Vin. Prun. Virg.

Wild Cherry, in No. 40 powder, *two hundred and fifty grammes*	**250 Gm.**
Water, *two hundred milliliters*	**200 mils**
Alcohol, *one hundred milliliters*	**100 mils**
Sugar, *one hundred and sixty-five grammes*	**165 Gm.**
Purified Talc, *fifteen grammes*	**15 Gm.**
Sherry Wine, *a sufficient quantity,*	
To make *one thousand milliliters*	**1000 mils**

Moisten the wild cherry with the water and transfer it to a percolator, and allow the percolator to remain well covered for three or four hours; then pack the moistened wild cherry moderately and pour on sufficient of a mixture of *one hundred milliliters* of alcohol and *six hundred and fifty milliliters* of sherry wine, to leave a stratum above the wild cherry. When the liquid begins to drop, close the lower orifice, and continue the maceration for twelve hours. Then allow the percolation to proceed slowly, gradually adding the remainder of the mixture of alcohol and wine, followed by sufficient sherry wine to make the percolate measure *nine hundred milliliters.* In this dissolve the sugar, add the purified talc and mix thoroughly; then filter, returning the first portions of the filtrate until it runs through clear, and pass sufficient sherry wine through the filter to make the product measure *one thousand milliliters.*

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

VINUM PRUNI VIRGINIANÆ FERRATUM

Ferrated Wine of Wild Cherry

Vin. Prun. Virg. Ferr.

Tincture of Ferric Citro-Chloride, *eighty milliliters*	**80 mils**
Wine of Wild Cherry, *nine hundred and twenty milliliters*	**920 mils**
To make *one thousand milliliters*	**1000 mils**

Mix; allow the mixture to stand for several days and then filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

VINUM RHEI COMPOSITUM

Compound Wine of Rhubarb

Vin. Rhei Co. Tinctura Rhei Vinosa, N.F. III

Fluidextract of Rhubarb, *eighty milliliters*	80 mils
Fluidextract of Bitter Orange Peel, *twenty milliliters* . . .	20 mils
Tincture of Cardamom, *eighty milliliters*	80 mils
Sugar, *one hundred and twenty-five grammes*	125 Gm.
Sherry Wine, *a sufficient quantity,*	
To make *one thousand milliliters*	1000 mils

Mix the fluidextracts and the tincture with *seven hundred milliliters* of sherry wine. In this dissolve the sugar by agitation, then add sufficient sherry wine to make the product measure *one thousand milliliters*, and filter.

AVERAGE DOSE—Metric, 4 mils—Apothecaries, 1 fluidrachm.

THE NATIONAL FORMULARY

PART II

ABSINTHIUM

Absinthium

Absinth. Wormwood

The dried leaves and flowering tops of *Artemisia Absinthium* Linné (Fam. *Compositæ*), without the presence of more than 5 per cent. of foreign matter.

Stems and leaves gray-green, finely silky-hairy and glandular throughout; largest leaves reaching 10 or 12 cm. in length and of nearly equal breadth, on long petioles, two to three times pinnately lobed or divided, the ultimate segments oblong or obovate, obtuse, entire or slightly toothed; upper leaves becoming shorter petioled, small and narrower, the uppermost being only about 2 cm. in length and resembling the ultimate segments of the larger ones; heads racemose-paniculate, drooping on short peduncles, greenish-yellow, from 3 to 4 mm. in breadth, round-ovoid, the outer bracts linear-oblanceolate, obtuse, the inner broader and scarious-margined; receptacle hairy; outer flowers sometimes pistillate. Odor characteristic, aromatic; taste very bitter.

The powdered drug is brownish to yellowish-green and, when examined under the microscope, exhibits numerous, characteristic, T-shaped, non-lignified hairs, consisting of a short, one- to four-celled stalk bearing a single apical cell attached near the center and up to 0.8 mm. in length and 0.035 mm. in width. Many of the hairs are more or less collapsed, twisted or broken; glandular hairs, some with one- or two-celled stalk, the glandular portions consisting of from four to eight secreting cells surrounded by a membrane; few simple hairs from the flowers, some of which are very long and up to 0.085 mm. in width; epidermal fragments with elliptical stomata the latter up to 0.035 mm. in length; fragments of mesophyll and palisade cells containing chloroplastids; tracheæ mostly spiral, up to 0.035 mm. in width; few sclerenchymatous fibers, with thick, usually lignified walls and simple pores, up to 0.02 mm. in width; pollen grains few, somewhat spherical or triangular in outline, up to 0.03 mm. in diameter; calcium oxalate crystals in rosette aggregates about 0.01 mm. in diameter.

Absinthium yields not more than 10 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

ACIDUM BROMAURICUM

Bromauric Acid

Acid. Bromaur.

It contains $HAuBr_4 + 5H_2O$ (607.97) corresponding to not less than 32 per cent. of gold, Au. Preserve it in glass-stoppered, amber-colored bottles.

Bromauric Acid occurs as dark red-brown, flat, needle-shaped crystals, or as irregular, coarse granular masses; odorless, and having a metallic and acid taste. Permanent in the air when pure; when chloride is present the salt is deliquescent.

Bromauric Acid melts at about 27° C.

It is very soluble in water and in alcohol.

Its aqueous solution is strongly acid to litmus, and yields with silver nitrate T.S. a yellowish-white precipitate, insoluble in nitric acid and but slightly soluble in ammonia water.

Ignite 0.1 Gm. of Bromauric Acid, heat the resulting residue of gold with 5 mils of nitric acid, add 15 mils of distilled water and filter; no weighable residue remains on evaporating the filtrate and igniting.

Dissolve 0.2 Gm. of Bromauric Acid in 10 mils of distilled water, add 16 mils of tenth-normal silver nitrate V.S. and 12 mils of ammonium carbonate T.S., digest the mixture for ten minutes on a water bath, then cool and filter. The filtrate, on supersaturating with nitric acid, does not become more than slightly opalescent (*chloride*).

Bromauric Acid is decomposed on exposure to red heat and leaves a residue of metallic gold equivalent to not less than 32 per cent. of the weight taken.

AVERAGE DOSE—Metric, 0.006 Gm.—Apothecaries, $\frac{1}{10}$ grain.

ACIDUM FORMICUM

Formic Acid

Acid. Formic.

An aqueous solution containing not less than 24 per cent. nor more than 26 per cent. of HCOOH (46.02).

Formic Acid is a clear, colorless liquid, having a strongly acid reaction and a characteristic pungent odor.

Specific gravity: about 1.058 at 25° C.

It is miscible with water or alcohol.

Formic Acid is volatilized on heating, and on evaporating 20 mils to dryness on a water bath, not more than 0.002 Gm. of residue remains.

A white precipitate of mercurous chloride is formed on warming Formic Acid with mercuric chloride T.S.

When Formic Acid is diluted with five times its volume of distilled water, separate portions yield no precipitate or turbidity on the addition of silver nitrate T.S. after adding nitric acid (*chloride*); or of barium chloride T.S. (*sulphate*); or of calcium chloride T.S. after supersaturating with ammonia water (*oxalic acid*).

Formic Acid, when supersaturated with solution of sodium hydroxide, develops no pungent or empyreumatic odor (*acrolein, allyl formate*).

Heat 1 mil of Formic Acid on a water bath with 1.5 Gm. of yellow mercuric oxide and 10 mils of distilled water for ten minutes and filter the liquid; the filtrate does not show an acid reaction (*acetic acid*).

Add 1 drop of tenth-normal iodine V.S. to 10 mils of Formic Acid; the iodine color is not destroyed (*sulphurous acid*).

Formic Acid does not respond to the Test for heavy metals (see page 357).

Assay.—Pour about 5 mils of Formic Acid into a weighing-bottle, stopper, weigh accurately, dilute with about 50 mils of distilled water and titrate with normal potassium hydroxide V.S., using phenolphthalein T.S. as indicator. It shows not less than 24 per cent. nor more than 26 per cent. of HCOOH.

Each mil of normal potassium hydroxide V.S. used corresponds to 0.04602 Gm. of HCOOH. Each gramme of Formic Acid corresponds to not less than 5.2 mils nor more than 5.65 mils of normal potassium hydroxide T.S.

AVERAGE DOSE—Metric, 0.3 mil—Apothecaries, 5 minims.

ADONIS

Adonis

Adonis Pheasant's Eye

The dried, overground portion of *Adonis vernalis* Linné (Fam. *Ranunculaceæ*), without the presence of more than 5 per cent. of foreign matter.

Glabrous, with the exception of the younger portions, which may be slightly grayish-puberulent; stems from 15 to 50 cm. in length, thick, but soft and weak; shining, simple or branched, the branches mostly from near the base and similar to the main stem; naked below, except for some scale-like leaf-vestiges, densely leafy above; leaves from 2 to 4 cm. in length and two-thirds or more as broad, pinnately divided into several segments, the larger of which are again divided, the ultimate segments being narrowly linear and acute; flowers terminal, yellow but usually drying to a cream color, from 3 to 6 cm. in breadth; sepals five, green or grayish-puberulent, more than half the length of the petals, oblong, obtuse, finely nerved; petals from five to twenty, oblong, obtuse, finely nerved; stamens indefinite; pistils numerous, in fruit forming an ovoid, obtuse, dense head of ovoid akenes, which are tipped with the very small, persistent styles. Odor faint; taste bitterish, afterward somewhat acrid.

The powdered drug is grayish-green and, when examined under the microscope, exhibits numerous fragments of pith parenchyma, the cells with few simple pores, up to 0.05 mm. in width and 0.25 mm. in length; groups of long narrow sclerenchyma fibers, mostly with lignified walls from 0.005 to 0.007 mm. in thickness and having a few rounded or oblique simple pores; tracheæ spiral or with bordered pores and up to 0.017 mm. in width; epidermal cells from the stem and petiole, elongated in surface view and with elliptical stomata, the latter about 0.064 mm. in length; fragments of the epidermal tissue from the lamina of the leaf, composed of finely striated cells with wavy, vertical walls, associated with broadly elliptical stomata, the latter up to 0.047 mm. in length; brownish colored fragments from the scales at the base of the stem, composed of elongated cells with somewhat rounded ends and yellowish-brown walls; starch grains and calcium oxalate crystals few or absent.

Adonis yields not more than 12 per cent. of ash.

AVERAGE DOSE—Metric, 0.125 Gm.—Apothecaries, 2 grains.

ÆTHER ACETICUS

Acetic Ether

(U.S.P. VIII)

Æth. Acet. Ethyl Acetate

A liquid containing not less than 96 per cent., by volume, of $C_4H_8O_2$ or $CH_3CO.OC_2H_5$ (88.06), the remainder consisting of alcohol and a little water. Preserve it in well-stoppered bottles, in a cool place, remote from fire and protected from light.

Acetic Ether is a transparent, colorless liquid, of a fragrant and refreshing, slightly acetous odor, and a peculiar acetous and burning taste.

Specific gravity: 0.887 to 0.895 at 25° C.

One mil of Acetic Ether is soluble in about 10 mils of water at 25° C.; miscible with alcohol, ether, or fixed or volatile oils.

It does not immediately redden blue litmus paper.

Boiling point: from 72° to 77° C.

Acetic Ether is readily volatilized, even at a low temperature. It is inflammable, burning with a yellowish flame and an acetous odor.

No weighable residue remains on evaporating 10 mils of Acetic Ether.

Allow 10 mils of Acetic Ether to evaporate spontaneously from clean, odorless blotting paper; the final odor does not resemble that of pineapple (*butylic or amylic derivatives*).

Pour carefully 2 mils of Acetic Ether on 10 mils of sulphuric acid; no dark ring is developed at the point of contact of the two layers within fifteen minutes (*readily carbonizable organic impurities*).

Mix 20 mils of Acetic Ether with a solution of 20 Gm. of sodium hydroxide in 50 mils of distilled water, allow the mixture to stand, agitating occasionally, or heat it gently under a reflux condenser, until a homogeneous liquid results, and then distil about 25 mils. This distillate complies with the Test for absence of methyl alcohol under *Alcohol* in the U. S. Pharmacopœia IX (see page 360).

Shake 25 mils of Acetic Ether in a graduated tube, with 25 mils of distilled water just previously saturated with Acetic Ether; the ethereal layer when separated measures not less than 24 mils (*undue proportion of alcohol or water*).

AVERAGE DOSE—Metric, 1 mil—Apothecaries, 15 minims.

AGARICUS

Agaric

Agaric. White Agaric Larch Agaric

The dried fruit body of the fungus *Polyporus officinalis* Fries (Fam. *Polyporaceæ*) [growing on one or more species of *Pinus* Linné, *Larix* Adanson, and *Picea* Link (Fam. *Pinaceæ*)], deprived of its outer rind, and without the presence of more than 10 per cent. of foreign matter.

Light, fibrous, somewhat spongy pieces of irregular shape; grayish-white to pale brown externally; yellowish and resinous internally; fracture tough, fibrous; friable but difficult to powder.

The powdered drug, examined under the microscope, shows numerous non-septate, narrow, mycelial threads and many cubical crystals of calcium oxalate from 0.01 to 0.02 mm. in diameter.

It yields to boiling alcohol not less than 50 per cent. of a resinous extract.

Agaric yields not more than 2 per cent. of a white ash, rich in phosphates.

AVERAGE DOSE—Metric, 0.6 Gm.—Apothecaries, 10 grains.

ALETRIS

Aletris

Aletr. Unicorn Root Star Grass

The dried rhizome and roots of *Aletris farinosa* Linné (Fam. *Liliaceæ*).

Rhizome horizontal or slightly oblique, nearly cylindrical or laterally compressed above, from 2 to 4 cm. in length and from 5 to 12 mm. in diameter; externally grayish-brown, upper portion with circular stem scars from 3 to 7 mm. in diameter and with numerous leaf bases, the sides and lower portion with numerous tough, wiry, whitish or reddish-brown roots which are more or less flexuose and provided with short branches; fracture short; internally light brown, cortex from 1 to 2 mm. in thickness,

central cylinder with numerous twisted and branching fibro-vascular bundles. Odor slight, acetous; taste sweetish, somewhat bitter.

Examined microscopically, the greater part of the drug is found to consist of parenchyma cells filled with spherical or ellipsoidal starch grains, from 0.008 to 0.016 mm. in diameter. Some of the parenchyma cells contain raphides, the latter being from 0.025 to 0.045 mm. in length. The tracheæ are reticulate or provided with simple pores and around these are several layers of lignified cells with thick walls and simple, large oblique pores. The endodermis is composed of several layers of thick-walled and closely-lamellated cells of a deep yellow color and the cortex is readily separated.

Aletris yields not more than 16 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

ALLIUM

Garlic

Allium

The fresh bulb of *Allium sativum* Linné (Fam. *Liliaceæ*).

Bulb subglobular, from 4 to 6 cm. in diameter, compound, consisting of from eight to fifteen bulbels and surrounded by one or two dry, whitish, membranaceous scales and attached to a flattened circular base from the lower portion of which arise numerous yellowish-white roots; bulbels more or less ovoid, in transverse section three to four sided, the outer surface being convex, summit acute and narrowed into a thread-like fibrous portion, base truncate, each bulbel covered by one or two layers of whitish, membranaceous, scale-like leaves, beneath which is the light brown or pinkish, thin and coriaceous layer of epidermis, cohering but easily separable from the solid portion of the bulbel. Odor of broken or bruised bulbels powerfully alliaceous; taste intensely pungent and persistent.

Under the microscope, transverse sections of the bulbel show three distinct portions: (a) the large fleshy scale consisting chiefly of parenchyma enclosing scattered vascular bundles, epidermis in both ventral and dorsal surfaces consisting of small tabular cells; (b) the middle layer nearly circular in outline, about 0.75 mm. in diameter, the tissues resembling those of the outer fleshy scale, but the cells containing numerous yellowish-brown plastids; (c) an innermost bright green layer consisting of a single leaf folded lengthwise along the midrib so that the ventral surfaces lie close together.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

ALTHÆÆ FOLIA

Althæa Leaves

Althæ. Fol. Marsh Mallow Leaves

The dried leaves of *Althæa officinalis* Linné (Fam. *Malvaceæ*), without the presence of more than 5 per cent. of stems or other foreign matter.

Gray-green or yellowish gray-green and densely and finely tomentose throughout; petioles one-sixth to one-fifth as long as the blades; blades varying from 5 to 15 cm. in length and from 3 to 10 cm. in breadth, cordate or rhomboidal-ovate in outline, rounded or occasionally nearly truncate at the base, acute at the summit; margin doubly serrate-dentate, the principal teeth from one to three pairs, the lowest almost

large enough to be regarded as lobes, the secondary very irregular, triangulate, acute, broader than long, the sinuses acute; two to four or occasionally six principal veins originating with the midrib in the petiole, prominent underneath, terete; branches of the midrib arising at a wide angle, nearly straight, each terminating in a marginal tooth. Leaf thin, but appearing thick because of its hairy covering. Odor slight, scarcely characteristic; taste mucilaginous.

The powdered drug is grayish to grayish-green and, when examined under the microscope, exhibits numerous unicellular, non-lignified, stellate branching hairs, up to 0.6 mm. in length, usually occurring in clusters of two to six; few, short-stalked, multicellular glandular hairs; calcium oxalate in rosette aggregates up to 0.025 mm. in diameter; fragments of epidermal tissue with stomata, the latter about 0.025 mm. in length; few lamellated mucilage cells; usually a few pollen grains, spherical, spiny, up to 0.1 mm. in diameter.

Althæa Leaves yield not more than 16 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

ALUMINI CHLORIDUM

Aluminum Chloride

Alum. Chlor.

It contains, when dried over sulphuric acid, $AlCl_3 + 6H_2O$ (241.58) corresponding to not less than 20.5 per cent. of aluminum oxide (Al_2O_3). Preserve it in well-closed containers.

Aluminum Chloride occurs as a white, or yellowish-white, deliquescent, crystalline powder; nearly odorless; taste sweetish and very astringent.

One gramme dissolves in about 0.5 mil of water and in about 4 mils of alcohol at 25° C., also soluble in glycerin.

An aqueous solution of the salt (1 in 10) is clear, and is acid to litmus. Separate portions of an aqueous solution of the salt (1 in 10) yield with silver nitrate T.S. a white curdy precipitate insoluble in nitric acid, with ammonia water a white gelatinous precipitate almost insoluble in an excess of ammonia water, and with sodium hydroxide T.S. a white gelatinous precipitate completely soluble in an excess of the reagent.

Ten mils of an aqueous solution of the salt (1 in 100), after the addition of 0.2 mil of barium chloride T.S., does not become cloudy within one minute (*sulphate*).

The addition of 0.3 mil of potassium ferrocyanide T.S. to 20 mils of an aqueous solution of the salt (1 in 150) does not produce a blue coloration within one minute (*iron*).

The addition of hydrogen sulphide T.S. to 10 mils of an aqueous solution of the salt (1 in 10) does not produce a white precipitate or turbidity (*zinc*).

An aqueous solution of the salt does not respond to the Test for heavy metals (see page 357).

An aqueous solution of the salt meets the requirements of the Test for arsenic (see page 356).

Assay.—Dissolve about 0.5 Gm. of the salt, previously dried in a desiccator and accurately weighed, in 100 mils of distilled water, add 1 Gm. of ammonium chloride and then precipitate the aluminum hydroxide by the addition of a slight excess of ammonia water to the boiling solution. Collect the precipitate on a filter, wash it with distilled water, dry, ignite thoroughly and weigh. The weight of the aluminum oxide so obtained is not less than 20.5 per cent. of the weight of the Aluminum Chloride taken for the assay.

AVERAGE DOSE—Metric, 0.3 Gm.—Apothecaries, 5 grains.

ALUMINI SULPHAS

Aluminum Sulphate

(U.S.P. VIII)

Alum. Sulph.

It contains not less than 99.5 per cent. of $Al_2(SO_4)_3+16H_2O$ (630.67).

Aluminum Sulphate occurs as a white crystalline powder, shining plates, or crystalline fragments; without odor, having a sweetish and afterwards an astringent taste; permanent in the air.

One gramme dissolves in 1 mil of water at 25° C., more soluble in boiling water, but insoluble in alcohol.

When gradually heated to about 200° C., it loses its water of crystallization (about 45.7 per cent. of its weight).

An aqueous solution of the salt (1 in 20) is acid to litmus.

Separate portions of an aqueous solution of the salt (1 in 20) yield with barium chloride T.S. a white precipitate insoluble in hydrochloric acid, and with sodium hydroxide T.S. a white gelatinous precipitate which is soluble in an excess of the alkali, but which is again separated on the addition of a sufficient amount of ammonium chloride T.S.

Gently heat 1 Gm. of Aluminum Sulphate with 10 mils of sodium hydroxide T.S.; the liquid does not evolve the odor of ammonia.

A filtered aqueous solution of the salt (1 in 10) does not become more than faintly opalescent within five minutes after the addition of an equal volume of tenth-normal sodium thiosulphate V.S. (*free acid*).

The addition of 5 drops of potassium ferrocyanide T.S. to 20 mils of an aqueous solution of the salt (1 in 150), does not produce at once a blue coloration (*iron*).

An aqueous solution of the salt does not respond to the Test for heavy metals (see page 357).

An aqueous solution of the salt meets the requirements of the Test for arsenic (see page 356).

Assay.—Dissolve about 0.5 Gm. of Aluminum Sulphate, accurately weighed, in 100 mils of distilled water, add 1 Gm. of ammonium chloride and then precipitate the aluminum hydroxide by the addition of a slight excess of ammonia water to the boiling solution. Collect the precipitate on a filter, wash it with distilled water, dry, ignite thoroughly and weigh. The weight of the aluminum oxide so obtained is not less than 16.1 per cent. of the weight of the Aluminum Sulphate taken for the assay, corresponding to not less than 99.5 per cent. of $Al_2(SO_4)_3+16H_2O$.

AMMONII HYPOPHOSPHIS

Ammonium Hypophosphite

Ammon. Hypophos.

It contains, when dried to constant weight at 100° C., not less than 97.5 per cent. of $NH_4PH_2O_2$ (83.10). Preserve it in well-closed containers.

Ammonium Hypophosphite occurs in deliquescent, colorless, hexagonal plates, or as a granular powder, odorless and having a saline and bitter taste.

One gramme dissolves in about 1 mil of water, and in about 20 mils of alcohol at 25° C.; very soluble in boiling water or boiling alcohol.

When heated, the salt is decomposed with the evolution of hydrogen phosphide, which is spontaneously inflammable.

An aqueous solution of the salt (1 in 20) is neutral or slightly acid to litmus, and when heated with sodium hydroxide gives off ammonia.

An aqueous solution of the salt (1 in 20) slightly acidulated with sulphuric acid, yields with silver nitrate T.S. a white precipitate, which rapidly turns brown or black, through the separation of metallic silver. Another portion of the solution, slightly acidulated with sulphuric acid, yields, on heating with copper sulphate T.S., a reddish-brown precipitate.

Ten mils of an aqueous solution of the salt (1 in 20) remains clear for five minutes after the addition of 5 mils of ammonium oxalate T.S. and a few drops of ammonia water (*calcium salt*).

An aqueous solution of the salt does not respond to the Test for heavy metals (see page 357).

Boil 5 mils of an aqueous solution of the salt (1 in 25) with 3 mils of sodium hydroxide solution until the ammonia is expelled, add 5 mils of nitric acid, and evaporate to dryness on a water bath; the residue meets the requirements of the Test for arsenic (see page 356).

Assay.—Dissolve about 0.2 Gm. of Ammonium Hypophosphite, previously dried to constant weight at 100° C. and accurately weighed, in 10 mils of distilled water, add 3 mils of sodium hydroxide T.S. and boil until the ammonia is expelled. Then add 5 mils of nitric acid and evaporate the solution to dryness on a water bath. Add 1 mil of nitric acid and again evaporate it to dryness on a water bath. Dissolve the residue in 20 mils of distilled water, transfer it to a 200 mil graduated flask, add a drop of phenolphthalein T.S. and sufficient sodium hydroxide T.S. (free from chloride) to produce a pink color, and then add 100 mils of tenth-normal silver nitrate V.S. and agitate well. Now gradually add zinc oxide (free from chloride) in small portions until the liquid is neutral to litmus, and then sufficient distilled water to make the mixture measure 200 mils. Agitate the mixture thoroughly, filter it through a dry filter and collect 100 mils of the filtrate (representing one-half of the Ammonium Hypophosphite taken). Add to this 2 mils of nitric acid and 2 mils of ferric ammonium sulphate T.S. and titrate with tenth-normal potassium sulphocyanate V.S. to the production of a permanent red color. It shows not less than 97.5 per cent. of $NH_4PH_2O_2$.

Each mil of tenth-normal silver nitrate V.S. used corresponds to 0.00277 Gm. of $NH_4PH_2O_2$. Each gramme of Ammonium Hypophosphite corresponds to not less than 352.0 mils of tenth-normal silver nitrate V.S.

AVERAGE DOSE—Metric, 0.2 Gm.—Apothecaries, 3 grains.

AMMONII PHOSPHAS

Ammonium Phosphate

Ammon. Phos.

It contains diammonium hydrogen phosphate [$(NH_4)_2HPO_4 = 132.13$] and ammonium dihydrogen phosphate [$NH_4H_2PO_4 = 115.09$], corresponding to not less than 20 per cent. of combined ammonia ($NH_3 = 17.03$). Preserve it in well-closed containers in a cool place.

Ammonium Phosphate occurs in colorless crystals, or as a white crystalline powder, losing ammonia on exposure to the air.

One gramme dissolves in about 4 mils of water; it is insoluble in alcohol. An aqueous solution (1 in 20) is neutral or alkaline to litmus.

Separate portions of an aqueous solution of the salt (1 in 20) yield with magnesia mixture T.S. a white precipitate, with silver nitrate T.S. a yellow precipitate, and, upon warming with ammonium molybdate T.S., a yellow precipitate.

Dissolve 1 Gm. of Ammonium Phosphate in 20 mils of distilled water; the resulting solution is not more than slightly turbid (*calcium, aluminum*).

Ten mils of an aqueous solution of the salt (1 in 100), acidulated with nitric acid, is not rendered more than slightly opalescent by silver nitrate T.S. (*chloride*).

Ten mils of an aqueous solution of Ammonium Phosphate (1 in 100) mixed with 2 mils of hydrochloric acid is not rendered turbid at once by the addition of a few drops of barium chloride T.S. (*sulphate*).

An aqueous solution of the salt does not respond to the Test for heavy metals (see page 357).

An aqueous solution of the salt meets the requirements of the Test for arsenic (see page 356).

Assay.—Transfer about 1 Gm. of Ammonium Phosphate, accurately weighed, to a distilling flask, dissolve it in 300 mils of distilled water and add 25 mils of an aqueous solution of sodium hydroxide (1 in 4). Connect the flask with a small glass condenser, the lower outlet tube of which is inserted beneath the surface of 50 mils of half-normal sulphuric acid V.S., contained in a flask of about 500 mils capacity, and distil the liberated ammonia into the acid. Titrate the excess of acid with half-normal potassium hydroxide V.S., using methyl orange T.S. as an indicator, and calculate the percentage of ammonia in the salt. It shows not less than 20 per cent. of NH_3.

Each mil of half-normal sulphuric acid V.S. used corresponds to 0.008515 Gm. of NH_3. Each gramme of Ammonium Phosphate corresponds to not less than 23.5 mils of half-normal sulphuric acid V.S.

AVERAGE DOSE—Metric, 0.3 Gm.—Apothecaries, 5 grains.

ANETHOL

Anethol

The methyl ether of para-propenyl phenol [$C_6H_4.C_3H_5.OCH_3 = 148.1$]. It is the main constituent in the oils of anise, star anise, and fennel, and is usually obtained from these by fractioning, chilling and crystallizing. Preserve it in well-stoppered, amber-colored bottles protected from light and air.

Anethol is a colorless or faintly yellow, highly refractive liquid at a temperature of 23° C. or above, having a sweet taste and the aromatic odor of anise. At from 20° to 21° C. it solidifies to a white, glistening, crystalline mass which remelts at from 22° to 23° C.

Anethol is almost insoluble in water, readily soluble in ether or chloroform, and forms a clear solution with two volumes of alcohol.

Specific gravity: 0.984 to 0.986 at 25° C.

Boiling point: 232° to 234° C.

Refractive index: 1.5 at 20° C.

It is optically inactive or shows a deviation of not more than 0.08° in a 100 mm. tube at 25° C., due to slight traces of the oil from which the Anethol has been prepared (if prepared from oil of anise, this deviation will be lævorotatory, if from oil of fennel, dextrorotatory).

Shake 10 mils of Anethol with 50 mils of a saturated aqueous solution of sodium bisulphite in a graduated cylinder and allow the mixture to stand for six hours. No appreciable diminution in the volume of Anethol will be observed nor does a crystalline deposit separate (*aldehydes*).

AVERAGE DOSE—Metric, 0.2 mil—Apothecaries, 3 minims.

ANGELICÆ FRUCTUS

Angelica Fruit

Angel. Fruct. Angelica Seed

The ripe fruit of *Angelica Archangelica* Linné (Fam. *Umbelliferæ*) and of other species of *Angelica*, without the presence of more than 3 per cent. of foreign matter.

Cremocarps oval, externally of a pale yellowish-brown color, from 4 to 8 mm. in length, 3 to 6 mm. in breadth and from 1 to 2 mm. in thickness, the base faintly notched, the summit bearing five minute calyx-teeth and the remains of the style; the two mericarps joined by their broad faces, or separate; each mericarp nearly flat upon one surface, which bears a central longitudinal groove and has sharp, slightly upturned margins, convex upon the other surface which is traversed longitudinally upon the back by three strong ribs, separated from one another by narrow grooves and from the margin by much broader grooves; pericarp soft, rather tough and corky and enclosing a single seed, showing on cross section six large oil-tubes. Odor characteristic and agreeable; taste aromatic, pungent, and sweetish.

Angelica Fruit yields not more than 8 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

ANGELICÆ RADIX

Angelica Root

Angel. Rad.

The rhizome and roots of *Angelica atropurpurea* Linné (Fam. *Umbelliferæ*) and of other species of *Angelica*, without the presence of more than 5 per cent. of stem bases and leaves or other foreign matter. Preserve Angelica Root in air-tight containers, adding a few drops of chloroform or carbon tetrachloride, from time to time, to prevent attack by insects.

Rhizomes short and thick, from 5 to 10 cm. in length, sometimes split, frequently crowned with the bases of stem and leaves; the roots are numerous, from 10 to 20 cm. in length and from 5 to 7 mm. in thickness at the base and gradually tapering to about 1 mm.; frequently twisted or braided together, externally dark gray-brown to reddish- or purplish-brown and with conspicuous, rather deep furrows; when dry breaking with a smooth fracture.

On cross section, the rhizome shows a distinct pith, which is absent in the root, and both exhibit a spongy bark nearly or quite as wide as the woody zone; in the bark are radial rows of brownish canals containing oleoresin. The wood rays are finely porous and narrower than the medullary rays. The bark is rich in starch. Odor strongly aromatic; taste sweetish, pungent, aromatic, and then bitter.

The powdered drug is yellowish-brown and, when examined under the microscope, exhibits numerous, mostly simple, irregularly spherical starch grains, up to 0.008 mm. in diameter, sometimes with the cleft at the center and occasionally two- or more compound; tracheæ or fragments of tracheæ, with reticulate markings or large simple pores up to 0.075 mm. in width; brownish oil canals or fragments thereof, up to 0.25 mm. in diameter, sometimes with adjoining epithelial cells; fragments of parenchyma tissue with some of the cells filled with starch; fragments of large brownish cork cells; sclerenchymatous fibers with thin walls and often with oblique markings; yellowish oil globules.

Angelica Root yields not more than 8 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

ANTIMONII OXIDUM

Antimony Oxide

Antim. Oxid.

It contains not less than 97 per cent. of antimonous oxide [$Sb_2O_3 = 288.4$].

Antimony Oxide is a white or grayish-white powder, odorless and tasteless.

It is insoluble in water, alcohol or nitric acid; readily dissolved by hydrochloric acid without effervescence, and also by a warm aqueous solution of tartaric acid or by a boiling aqueous solution of potassium bitartrate.

When heated Antimony Oxide turns yellow but it again becomes white on cooling. At a dull red heat it fuses to a yellowish liquid and at a higher temperature it volatilizes.

Dissolve Antimony Oxide in a slight excess of hydrochloric acid and dilute the solution with a large volume of distilled water; a white precipitate is produced which is changed to orange by hydrogen sulphide.

A solution of 0.1 Gm. of the Oxide in 3 mils of hydrochloric acid and 5 mils of distilled water is not rendered turbid at once by a few drops of barium chloride T.S. (*sulphate*).

A solution of 0.1 Gm. of the Oxide in 10 mils of distilled water and 1 Gm. of tartaric acid does not become more than slightly opalescent on the addition of 0.2 mil of nitric acid and 0.2 mil of silver nitrate T.S. (*chloride*).

Dissolve 0.5 Gm. of the Oxide in 10 mils of hydrochloric acid, dilute the solution with distilled water until it begins to become permanently turbid and then precipitate with hydrogen sulphide. This precipitate when thoroughly washed with distilled water dissolves in ammonium sulphide T.S. or sodium sulphide T.S., without leaving a black insoluble residue (*copper or lead*).

A solution of 0.1 Gm. of Antimony Oxide in 5 mils of hydrochloric acid does not respond to Bettendorf's Test for arsenic (see page 357).

Assay.—Dissolve about 0.2 Gm. of Antimony Oxide, accurately weighed, by warming it in a solution of 1 Gm. of tartaric acid in 10 mils of distilled water (adding a few drops of hydrochloric acid to aid the solution). Nearly neutralize the solution with sodium carbonate, then add 40 mils of a cold saturated solution of sodium bicarbonate and titrate at once with tenth-normal iodine V.S., using starch T.S. as indicator. It shows not less than 97 per cent. of Sb_2O_3.

Each mil of tenth-normal iodine V.S. corresponds to 0.00721 Gm. of Sb_2O_3. One gramme of Antimony Oxide corresponds to not less than 134.5 mils of tenth-normal iodine V.S.

AVERAGE DOSE—Metric, 0.06 Gm.—Apothecaries, 1 grain.

ANTIMONIUM SULPHURATUM

Sulphurated Antimony

Antim. Sulphurat. Antimonium Oxysulphuratum Kermes Mineral

Chiefly antimony trisulphide [$Sb_2S_3 = 336.6$] with small quantities of antimony trioxide, sodium pyroantimonate, and free sulphur. It contains not less than 45 per cent. of antimony (Sb). Preserve it in well-closed containers, protected from light.

It occurs as a red-brown powder, becoming lighter in color on exposure to light; odorless and tasteless. Insoluble in water and in alcohol.

One gramme of Sulphurated Antimony, warmed, with 10 mils of hydrochloric acid dissolves with the evolution of hydrogen sulphide, leaving a small amount of residue composed chiefly of sulphur. Its hydrochloric acid solution, after the removal of the hydrogen sulphide by boiling, yields a white precipitate when greatly diluted with water; the liquid separated from this precipitate yields an orange-red precipitate with hydrogen sulphide.

Shake about 1 Gm. of Sulphurated Antimony with 20 mils of distilled water and filter. The filtered liquid is neutral to litmus and a portion of it remains clear upon the addition of ammonium oxalate T.S. (*calcium*); another portion does not become more than slightly turbid upon the addition of barium chloride T.S. (*sulphate*).

Boil 1 Gm. of Sulphurated Antimony with 100 mils of distilled water until the volume is reduced to about 10 mils, filter it and thoroughly wash the residue on the filter with distilled water. The combined filtrate and washings, after evaporation to about 1 mil, does not respond to Bettendorf's Test for arsenic (see page 357).

Mix about 1 Gm. of Sulphurated Antimony, accurately weighed, with 20 mils of hydrochloric acid and then add 5 Gm. of tartaric acid dissolved in 20 mils of distilled water. Heat the mixture on a water bath until the vapors evolved no longer blacken lead acetate test paper, then filter, wash the residue on the filter until the washings are neutral to litmus and dry it at 100° C. The weight of this residue does not exceed 4 per cent. of the weight of Sulphurated Antimony taken, and it should burn with the odor of sulphur dioxide, leaving an ash not exceeding 0.2 per cent. of the Sulphurated Antimony taken.

Assay.—Dilute the combined filtrate and washings from the preceding test to 200 mils. Neutralize 50 mils of this solution with sodium carbonate, add 25 mils of a cold saturated aqueous solution of sodium bicarbonate and at once titrate with tenth-normal iodine V.S., using starch T.S. as indicator. It shows not less than 45 per cent. of antimony.

Each mil of tenth-normal iodine V.S. corresponds to 0.00601 Gm. of antimony (Sb). Each gramme of Sulphurated Antimony requires not less than 74.9 mils of tenth-normal iodine V.S.

APII FRUCTUS

Celery Fruit

Apii Fruct. Celery Seed

The ripe fruit of *Apium graveolens* Linné (Fam. *Umbelliferæ*), without the presence of more than 10 per cent. of foreign fruit or other foreign matter.

The fruits consist of two mericarps which may be united or separate. Mericarps ovoid, slightly curved, from 1 to 2 mm. in length, rather more than half as broad and about half as thick, of a rather deep brown color; the inner surface flat, the outer convex, smooth except for five very slender light-colored ribs, two of which are marginal. Oil-tubes in the pericarp from 6 to 15. Odor characteristic, agreeable; taste aromatic, warm and somewhat pungent.

Transverse sections, when examined under the microscope, exhibit nearly equilateral pentagonal mericarps, with somewhat convex surfaces; the carpophore consisting of two groups of strongly lignified sclerenchyma cells; each mericarp has from six to fifteen vittæ in the pericarp, the latter closely surrounding a somewhat pentagonal seed; the pericarp has an epidermal layer of cells elongated tangentially and with a thick cuticle; a few of the cells are developed into short, smooth papillæ; a fibro-vascular bundle in each of the prominent ribs, composed of a few tracheæ and strongly lignified sclerenchyma fibers; the inner tissue of the pericarp consists of largely tangentially elongated parenchyma with brownish walls; the seed consists chiefly of endosperm; the seed coat is composed of several layers of yellowish more or less collapsed cells, the endosperm of thick-walled polygonal cells containing fixed oil and aleurone grains, the latter each containing a small rosette aggregate of calcium oxalate.

The powdered drug is oily and has a brown color and, when examined under the microscope, exhibits fragments of the pericarp showing yellowish vittæ, brown secretion cells and few of the epidermal papillæ; tracheæ and sclerenchyma fibers; cells of the endosperm with aleurone grains containing rosette aggregates of calcium oxalate from 0.002 to 0.006 mm. in diameter.

Celery Fruit yields not more than 8 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

APOCYNUM

Apocynum

(U.S.P. VIII)

Apocyn. Canadian Hemp

The dried rhizome and roots of *Apocynum cannabinum* Linné (Fam. *Apocynaceæ*), without the presence of more than 5 per cent. of stems or other foreign matter.

Cylindrical, somewhat branched, of varying length, from 3 to 10 mm. in thickness; externally reddish-brown to grayish-brown, longitudinally wrinkled and occasionally with transverse fissures having vertical sides extending through the bark; fracture short; internally, bark light brown, from 1.5 to 3 mm. in thickness, wood faintly radiate and with large tracheæ, a small pith occurring in pieces of the rhizome. Almost inodorous; taste starchy, afterwards becoming bitter and somewhat acrid.

Under the microscope sections of Apocynum show numerous laticiferous vessels in both the bark and pith.

The stems of Apocynum have a comparatively thin fibrous bark, a light brown porous wood and a large, hollow pith.

The powder is light brown, starch grains numerous, from 0.003 to 0.015 mm. in diameter, spherical, ellipsoidal, ovate, pyriform, or more or less irregular, sometimes more or less altered, swollen, and with a hyaline central cleft; numerous fragments of strongly lignified wood fibers, associated with trachcæ mostly having bordered pores, occasionally with spiral thickenings; fragments of cork layer few, the walls being of a reddish-brown color; an occasional fragment with laticiferous tissues; stone cells few or absent (*Apocynum androsaemifolium* Linné).

Apocynum yields not more than 5 per cent. of ash.

AVERAGE DOSE—Metric, 0.75 Gm.—Apothecaries, 12 grains.

CAUTION—It has been stated that the absorption of Apocynum in the gastro-intestinal tract is uncertain and irregular. To avoid an accumulation of the drug or toxic action, the physician should carefully guard the dosage and determine in each case the tolerance of the patient.

ARALIA

Aralia

Aral. American Spikenard Spignet

The dried rhizome and roots of *Aralia racemosa* Linné (Fam. *Araliaceæ*), without the presence of more than 5 per cent. of adhering stem bases, or other foreign matter.

Rhizome of oblique growth, about 12 cm. in length and 5 cm. in thickness, somewhat flattened, tortuous, externally pale brown, somewhat annulately roughened, frequently cut longitudinally, whitish internally; nodes approximate, each with a prominent stem scar about 3 cm. in breadth; fracture fibrous; roots numerous, of varying length, from 5 to 25 mm. in thickness, usually cut longitudinally and furrowed, sometimes with transverse ridges and corky patches; light brown or purplish-brown externally, whitish and spongy or porous internally; fracture of the cortex short, of the wood short and fibrous. Odor aromatic; taste mucilaginous, pungent and slightly acrid.

A transverse section of the root shows a thick bark with several zones of secretion reservoirs containing oil, a well-developed cork with one or more hypodermal layers of lignified cells, and a more or less distinctly radiate wood.

Examined microscopically, the powdered drug shows spherical or angular, single or two- or more compound starch grains, from 0.005 to 0.02 mm. in diameter, rosette

aggregates of calcium oxalate from 0.03 to 0.07 mm. in diameter, tracheæ with scalariform or reticulate thickenings and simple or bordered pores, characteristic lignified cells from the hypodermis about 0.04 to 0.1 mm. in length and about one-half as broad, their walls showing simple pores (distinction from *Aralia nudicaulis*).

Aralia yields not more than 10 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

ASARUM
Asarum

Asar. Canada Snake-root Wild Ginger

The dried rhizome and roots of *Asarum canadense* Linné (Fam. *Aristolochiaceæ*), with only an occasional leaf or flower present, and without the presence of more than 5 per cent. of other foreign matter.

Of horizontal growth, occasionally branched, two-edged when young, quadrangular when older, finely striate, usually more or less twisted, from 5 to 17 cm. in length and from 2 to 4 mm. in thickness; nodes enlarged with irregular scars from petioles and remains of pedicels; internodes with annular scars from scales; dark purplish-brown externally; fracture short, internally whitish, starchy or resinous; attached roots few, from 5 to 7 cm. in length and not over 1 mm. in thickness, having from four to six radial fibro-vascular bundles. Odor aromatic, non-irritating upon heating; taste pungent and slightly bitter.

In transverse section the rhizome shows a thick bark with numerous oil cells, a wood with about twelve fibro-vascular bundles and a large pith.

Examined microscopically, the powdered drug shows simple and two- to four-compound starch grains, the individual grains being from 0.004 to 0.02 mm. in diameter, and tracheæ with scalariform or reticulate thickenings, a few spiral.

Asarum yields not more than 12 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

ASCLEPIAS
Asclepias

Asclep. Pleurisy Root

The dried roots of *Asclepias tuberosa* Linné (Fam. *Asclepiadaceæ*), without the presence of more than 5 per cent. of foreign matter.

Usually cut or broken pieces, of variable size, of an irregularly fusiform root, which, when entire is from 10 to 20 cm. in length and from 0.5 to 5 cm. in thickness; occasionally branched; externally pale orange-brown, becoming grayish-brown, annulate above, the surface roughened by numerous fine intersecting grooves; bark thin; fracture tough, the broken surface granular and white, with inconspicuous pale yellow wood bundles and large white medullary rays. Odor slight; taste bitterish and disagreeable, somewhat acrid.

The powdered drug is yellowish-brown and, when examined with the microscope, shows numerous simple or two- to four-compound starch grains, the individual grains up to 0.015 mm. in diameter, somewhat spherical in shape, or truncate and often with a cleft at center; calcium oxalate crystals in rosette aggregates up to 0.04 mm. in diameter; strongly lignified thick-walled stone cells up to 0.075 mm. in diameter and with simple or branching pores; tracheæ with reticulate markings, occasionally bordered pores; spindle-shaped sclerenchyma fibers few, lignified and mostly with simple pores.

Asclepias yields not more than 9 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

BAPTISIA

Baptisia

Baptis. Wild Indigo

The dried roots of *Baptisia tinctoria* (Linné) R. Brown (Fam. *Leguminosæ*), without the presence of more than 10 per cent. of the crown and stem or other foreign matter.

Fleshy, from 0.5 to 4 cm. in thickness, usually cut into elongated cylindrical pieces; the crown from 5 to 8 cm. in thickness, more or less warty and marked by stem scars; outer surface dark-brown; usually longitudinally wrinkled, transversely warty, or the thicker pieces covered with a soft and friable corky layer, bearing few branching rootlets; fracture tough, the fractured surface whitish; bark-section radially striate, wood-section inconspicuously radiate, porous. Nearly odorless; the bark bitter and acrid, the wood nearly tasteless.

The powdered drug is light-grayish and, when examined with the microscope, shows numerous, rounded, simple, or two- to four-compound starch grains up to 0.016 mm. in diameter, the larger grains sometimes with a cleft through the center; tracheæ with bordered pores up to 0.085 mm. in diameter; numerous sclerenchyma cells, long, thick-walled, non-porous, more or less lignified and up to 0.024 mm. in width; fragments of medullary-ray tissue composed of cells with lignified walls and numerous simple pores; groups of parenchyma, many of the cells filled with starch; few epidermal and cork cells with brownish walls.

Baptisia yields not more than 5 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

BERBERIS

Berberis

(U.S.P. VIII)

Berber. Oregon Grape Root

The rhizome and roots of species of the section *Odostemon* Rafinesque of the genus *Berberis* Linné (Fam. *Berberidaceæ*), without the presence of more than 5 per cent. of the overground parts of the plant or other foreign matter. Berberis without the bark should be rejected.

Cylindrical, more or less knotty, strongly branched, usually cut into pieces of varying length and up to 45 mm. in diameter; externally light yellowish-brown, longitudinally wrinkled and short scaly; fracture hard and tough; bark 1 mm. in thickness, easily separable into layers; wood yellow, the color more pronounced upon wetting, distinctly radiate, and showing rings of growth; pith of rhizome small, sometimes excentral. Slightly odorous; taste distinctive, very bitter; on chewing it tinges the saliva yellow.

The powder is yellowish-brown; composed chiefly of fragments of wood fibers associated with a few tracheæ and medullary rays; wood fibers yellowish, scarcely giving any reaction with phloroglucinol T.S. and hydrochloric acid, and with large, simple, transverse pores; tracheæ chiefly with bordered pores, occasionally reticulate; medullary rays one to twelve cells wide, and in very long rows; starch grains simple or two- to three-compound, the individual grains being irregularly spherical, from 0.003 to 0.01 mm. in diameter, and occasionally larger.

Berberis yields not more than 5 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

BOLDUS

Boldo

Boldo Leaves

The leaves of *Boldu Boldus* (Molina) Lyons (Fam. *Monimiaceæ*), without the presence of more than 2 per cent. of stems or other foreign matter.

Broadly ovate or oval, from 3 to 7 cm. in length and from 1 to 4 cm. in breadth, the base varying from rounded to very slightly indented, the summit rounded or slightly notched, the margin entire and sharply revolute; thick, coriaceous, rigid and brittle; from pale-green to brownish-green, papillose, roughened on both surfaces, the principal veins coarsely reticulate, impressed above, sharply prominent underneath; the petiole stout and rigid, from 1 to 5 mm. in length, reticulate. Odor peculiar; when crushed very strong, disagreeable, and somewhat like that of oil of chenopodium; taste bitter, warm and pungent, camphoraceous and slightly terebinthinate.

Under the microscope a transverse section shows a well-marked hypodermis from which develop papilla-like excrescences, each crowned with a group of radiating, one-celled, thick-walled hairs; on the lower surface stomata numerous and hairs somewhat smaller, mesophyll with numerous oil secretion cells.

Boldo yields not more than 10 per cent. of ash.

AVERAGE DOSE—Metric, 0.5 Gm.—Apothecaries, 8 grains.

BRAYERA

Brayera

(U.S.P. VIII)

Brayer. Kousso Cusso

The dried panicles of the pistillate flowers of *Hagenia abyssinica* (Bruce) Gmelin (Fam. *Rosaceæ*), without the presence of more than 10 per cent. of the staminate flowers, other parts of the tree, or other foreign matter. Reject any portions of the stems over 3 mm. in diameter and any binding material, before the drug is powdered or used.

Usually in rolls or flattened bundles from 25 to 50 cm. in length, reddish-brown, or occurring more or less loose and stripped from the larger portions of the panicles. Panicle branches cylindrical, somewhat flattened, longitudinally furrowed or wrinkled, externally light brown to yellowish, tomentose, glandular; internally, cork brownish, bast- and wood-fibers yellow, fibro-vascular bundles in wedges, pith large and yellowish-brown; nodes distinct, each with a scar or branch and subtended by a sheathing bract; internodes mostly from 1 to 2 cm. in length; flowers subtended by two ovate, reddish, pubescent and glandular bracts; pedicel short; calyx turbinate, pubescent below, subtended by four or five rigid, spreading, obovate, purple-veined bractlets which are persistent and elongated in fruit, alternating with and larger than the five usually shriveled, reflexed calyx lobes; petals five, caducous, and usually absent in the drug; carpels two; styles exserted, stigmas broad and hairy with prominent papillæ; fruit an ovoid akene about 2 mm. in diameter, enclosed by the remains of the calyx. The staminate flowers are greenish-yellow, with about twenty fertile stamens. Odor slight; taste bitter.

The powdered drug is light brown or reddish-brown and, when examined under the microscope, exhibits numerous simple, non-glandular, straight or curved hairs, up to

about 1 mm. in length, with thick, strongly lignified walls, usually enlarged at the base; glandular hairs with one- to three-celled stalks, the glandular head unicellular or consisting of one or two pairs of cells; tracheæ spiral, annular, scalariform or with bordered pores, up to 0.05 mm. in width; sclerenchymatous fibers long, thick-walled, strongly lignified and with numerous, simple, oblique pores; parenchyma of pith more or less lignified and with large simple pores; fragments of epidermal tissue from the bracts and calyx with elliptical stomata up to 0.03 mm. in length; groups of thin-walled, somewhat branching parenchyma cells with large intercellular spaces; tissue from the inner surface of the pericarp consisting of numerous, elongated, porous, strongly lignified cells; calcium oxalate in rosette aggregates up to 0.04 mm. in diameter; occasionally fragments of tissue containing prisms of calcium oxalate, the latter about 0.014 mm. in length; pollen grains few, nearly spherical, from 0.025 to 0.04 mm. in diameter, with three pores. The larger branches of the panicles exhibit simple, non-glandular hairs up to about 5 mm. in length; tracheæ up to 0.125 mm. in width and rosette aggregates of calcium oxalate up to about 0.075 mm. in diameter.

Brayera yields not more than 9 per cent. of ash.

AVERAGE DOSE—Metric, 15 Gm.—Apothecaries, 240 grains.

BROMUM

Bromine

(U.S.P. VIII)

It contains not less than 98 per cent. of Br (79.92) and not more than 2 per cent. of Cl. Preserve Bromine in glass-stoppered bottles in a cool place, the bottle being enclosed in a larger vessel with the space between filled with some substance capable of absorbing and combining with any vapors which might escape.

Bromine is a heavy, dark brownish-red, mobile liquid, evolving, even at ordinary temperatures, reddish fumes, highly irritating to the eyes and lungs, and having a peculiar, suffocating odor, resembling that of chlorine.

Specific gravity: about 3.016 at 25° C.

Boiling point: about 63° C.

One mil dissolves in about 90 mils of water; it is freely soluble in alcohol, ether chloroform, or carbon disulphide.

On exposure to air it volatilizes.

It destroys the color of solutions of litmus or indigo, and imparts a yellow color to starch T.S.

Add 5 mils of Bromine to an excess of sodium hydroxide T.S.; it combines to form a permanently clear liquid, without the separation of oily drops (*organic bromine compounds*).

Shake 10 mils of a saturated aqueous solution of Bromine with a slight excess of reduced iron until it becomes nearly colorless, filter the liquid and add 5 drops of ferric chloride T.S. and 5 drops of starch T.S.; it does not assume a blue color (*iodine*).

Assay.—Dissolve 10 Gm. of potassium iodide in 25 mils of distilled water, introduce the solution into a 100 mil measuring flask, stopper and determine accurately the weight of the flask and its contents. Add about 1 Gm. of Bromine to the contents of the flask, determine its exact weight and then fill the flask to the mark with distilled water and titrate 25 mils of this solution with tenth-normal sodium thiosulphate V.S., using starch T.S. as indicator. It shows not less than 98 per cent. of Br with not more than 2 per cent. of Cl.

Each mil of tenth-normal sodium thiosulphate V.S. used corresponds to 0.007992 Gm. of Br or 0.003546 Gm. of Cl. Each gramme of Bromine (containing not more than 2 per cent. of chlorine) corresponds to not more than 128.3 mils of tenth-normal sodium thiosulphate V.S.

BRYONIA

Bryonia

Bryon. Bryony

The dried root of *Bryonia alba* Linné or of *Bryonia dioica* Jacquin (Fam. *Cucurbitaceæ*), without the presence of more than 5 per cent. of foreign matter.

Usually in circular or elliptical slices, obtained by cutting the root more or less transversely, from 1.5 to 10 cm. in breadth and from 3 to 15 mm. in thickness; the edges light gray or yellowish, rough and striate, the cut surface white or faintly yellow, showing a thin cortex and a wood with numerous projecting, collateral fibro-vascular bundles arranged in concentric zones; fracture short and mealy, whitish internally. Odor faint but distinct and characteristic; taste bitter and nauseous.

The powdered drug is of a light yellow color and, when examined under the microscope, shows simple, rounded, or two- or more compound, starch grains from 0.004 to 0.024 mm. in diameter, frequently with a central cleft, tracheæ from 0.035 to 0.25 mm. in width, reticulate or with bordered pores, and large yellow cork cells.

Add sulphuric acid to the powdered drug; it becomes reddish-brown and then brownish-purple.

Bryonia yields not more than 8 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

CACAO PRÆPARATUM

Cocoa

Cacao Præp. Prepared Cacao

A powder prepared from the roasted, cured kernels of the ripe seeds of *Theobroma Cacao* Linné and of other species of *Theobroma* (Fam. *Sterculiaceæ*), deprived of a portion of its fat.

A brownish powder having a chocolate-like odor and taste, free from sweetness.

Extracted with cold water, Cocoa yields not less than 14 per cent. nor more than 22 per cent. of soluble matter.

Extracted with ether, Cocoa yields not less than 18 per cent. of fat, and the fatty residue does not have a spicy odor or taste.

The residue, insoluble in ether, when examined under the microscope, shows not more than 3 per cent. of Cocoa shells, and no foreign starch granules or other foreign substances.

Cocoa contains not more than 6 per cent. of crude fiber and not more than 12 per cent. of starch.

Cocoa yields not less than 3.5 per cent. nor more than 8 per cent. of ash, which has a distinctly reddish color.

CACTUS GRANDIFLORUS

Cactus Grandiflorus

Cact. Grand. Night Blooming Cereus

The fresh succulent stems of the wild growing *Cactus grandiflorus* Linné (*Cereus grandiflorus* Miller) (Fam. *Cactaceæ*). As found in commerce, Cactus Grandiflorus is usually preserved in alcohol and the amount of alcohol present should be stated on the label.

It occurs in pieces of varying length, from 1.5 to 4 cm. in diameter, and from five to seven angled. On the angles at intervals of about 2 cm. are tufts of from nine to twelve spines, each about 2 mm. in length, and three slender flexuous spines about 1 cm. in length; at irregular intervals are branched roots. It has a strong, herby odor; taste acidulous and mucilaginous.

The transverse section shows a central cylinder about 3 mm. in diameter and a spongy parenchyma containing large crystals and raphides of calcium oxalate.

CALAMINA PRÆPARATA

Prepared Calamine

Calamin. Præp. Lapis Calaminaris

Native zinc carbonate containing a varying amount of zinc silicate, calcined at a moderate temperature; or calcined zinc carbonate, containing a small amount of ferric oxide.

Prepared Calamine is a pink powder readily passing through a number 100 sieve. It is insoluble in water, but mostly dissolved by hydrochloric acid.

Digest 1 Gm. of Prepared Calamine for one hour on a water bath with 25 mils of diluted hydrochloric acid, adding distilled water to replace that lost through evaporation, filter the liquid and dilute the filtrate with distilled water to 100 mils. Portions of 10 mils each of this diluted filtrate conform to the following tests: no precipitate forms within ten minutes on adding potassium iodide T.S. (*lead*); boil a portion with a few drops of nitric acid, then with an excess of ammonia water and filter; it yields an abundant white precipitate with hydrogen sulphide T.S. (presence of *zinc*); an excess of hydrochloric acid added to another portion, followed by potassium ferrocyanide T.S., produces an abundant white or bluish-white precipitate (presence of *zinc*).

Dilute a portion of the above solution with four parts of distilled water, slightly acidulate with acetic acid, and add ammonium oxalate T.S.; it shows not more than a slight turbidity (*calcium*); slightly acidulate a portion with hydrochloric acid, and add 2 mils of potassium sulphate T.S.; not more than a slight turbidity shows at once (*soluble barium salts*).

Fuse the residue, which remains after preparing the solution for the preceding tests, with sodium carbonate, treat the mass with hot distilled water, filter and wash. Then dissolve the residue in diluted hydrochloric acid and dilute to 20 mils. Ten mils of this solution does not become turbid upon the addition of 5 mils of potassium sulphate T.S. (*barium sulphate*).

CALCII LACTOPHOSPHAS

Calcium Lactophosphate

Calc. Lactophos.

A mixture in variable proportions of calcium lactate, calcium acid lactate, and calcium acid phosphate.

Calcium Lactophosphate occurs in white granules or as a white powder, without odor.

It is soluble in water, almost insoluble in alcohol.

Its aqueous solution (1 in 20) is acid to litmus.

The addition of ammonium oxalate T.S. to an aqueous solution of Calcium Lactophosphate produces a white precipitate insoluble in acetic acid but soluble in hydrochloric acid.

Add 10 mils of diluted sulphuric acid and 5 mils of potassium permanganate T.S. to 5 mils of an aqueous solution of Calcium Lactophosphate (1 in 20) and gently warm the mixture; the odor of acetaldehyde is evolved.

Add silver nitrate T.S. or ammonium molybdate T.S. to separate portions of an aqueous solution of Calcium Lactophosphate (1 in 20); a yellow precipitate is produced.

Mix 0.5 Gm. of Calcium Lactophosphate with 5 mils of sulphuric acid; not more than a slight coloration results within one minute (*readily carbonizable impurities*).

Ten mils of an aqueous solution of Calcium Lactophosphate (1 in 100), mixed with 1 mil of diluted hydrochloric acid, does not at once become turbid on the addition of a few drops of barium chloride T.S. (*sulphate*).

Ten mils of an aqueous solution of Calcium Lactophosphate (1 in 100), when mixed with a few drops of nitric acid, yields not more than an opalescence on the addition of a few drops of silver nitrate T.S. (*chloride*).

An aqueous solution of Calcium Lactophosphate does not respond to the Test for heavy metals (see page 357).

Mix 0.2 Gm. of Calcium Lactophosphate with 1 Gm. of potassium nitrate, ignite the mixture cautiously in small portions at a time until the carbonaceous matter is all or nearly all burned off, then add to the residue 20 mils of diluted sulphuric acid and evaporate the mixture until fumes of sulphuric anhydride are evolved. The residue meets the requirements of the Test for arsenic (see page 356).

Dissolve 1 Gm. of Calcium Lactophosphate and 2 Gm. of ammonium chloride in 75 mils of distilled water, heat the solution to boiling and add an excess of ammonium oxalate T.S. (about 20 mils). Allow the precipitate to subside completely, then filter and supersaturate the filtrate with ammonia water; not more than a slight turbidity is produced (*magnesium*).

AVERAGE DOSE—Metric, 0.5 Gm.—Apothecaries, 8 grains.

CALCII PHOSPHAS PRÆCIPITATUS

Precipitated Calcium Phosphate

(U.S.P. VIII)

Calc. Phos. Præc.

Calcium Phosphate [$Ca_3(PO_4)_2 = 310.29$] losing, when dried at 200° C., not more than 4 per cent. of moisture.

Precipitated Calcium Phosphate occurs as a white, amorphous or micro-crystalline, bulky powder, odorless and tasteless; permanent in the air. At an intense white heat the salt fuses without decomposition.

Almost insoluble in cold water; partly decomposed by boiling water; almost insoluble in acetic acid, except when freshly precipitated; easily dissolved by hydrochloric or nitric acid; insoluble in alcohol.

When moistened with silver nitrate T.S., either before or after ignition, the salt acquires a yellow color (distinction from *acid calcium phosphate*, which, after ignition, when moistened with silver nitrate T.S., remains white).

For applying tests of identity and of purity, prepare a solution by shaking 2 Gm. of Precipitated Calcium Phosphate with 20 mils of distilled water, adding nitric acid, drop by drop, until solution is effected, and then sufficient distilled water to make the liquid measure 40 mils. While making this solution, no effervescence occurs on adding the acid (*carbonate*).

To a portion of this solution add a slight excess of ammonia water, then an excess of silver nitrate T.S. and afterwards acetic acid, drop by drop, until the excess of ammonia is neutralized; the color of the precipitate changes from white to yellow.

Ammonium molybdate T.S. precipitates from the solution yellow ammonium phosphomolybdate; the reaction is accelerated by a gentle heat, not exceeding 65° C.

Add to five mils of the solution, acidulated with nitric acid, 0.5 mil of silver nitrate T.S.; not more than a slight turbidity is produced (*chloride*).

Add to five mils of the solution, strongly acidulated with nitric acid, 1 mil of potassium sulphate T.S.; no turbidity appears within fifteen minutes (*barium*).

An aqueous solution of Precipitated Calcium Phosphate (1 in 50), obtained by shaking the salt with distilled water, adding hydrochloric acid, drop by drop, and heating until solution is effected, does not respond to the Test for heavy metals (see page 357).

Five mils of a solution of Precipitated Calcium Phosphate in diluted nitric acid (1 in 25), heated with 1 mil of sulphuric acid until fumes of sulphur trioxide appear, does not respond to the Test for arsenic (see page 356).

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

CALENDULA

Calendula

(U.S.P. VIII)

Calend. Marigold

The dried ligulate florets of *Calendula officinalis* Linné (Fam. *Compositæ*), without the presence of more than 2 per cent. of other parts of the plant or other foreign matter.

Florets from 15 to 25 mm. in length, yellow- or orange-colored, one- to three-toothed, four- or five-veined, margin nearly entire, the short hairy tube occasionally enclosing the remnants of a filiform style and bifid stigma. Odor slight, somewhat heavy; taste slightly bitter, faintly saline.

The powdered drug is light yellow to orange-yellow and, when examined under the microscope, exhibits a few characteristic, non-glandular hairs, consisting of a double row of thin-walled, more or less collapsed cells, with a one- or two-celled summit, and up to about 0.8 mm. in length; elongated epidermal cells with thin, somewhat wavy walls, a striated surface, and containing irregular chromoplasts and oil-like globules, the latter coalescing when mounted in hydrated chloral T.S.; pollen grains, more or less spherical, with numerous spinose projections, three pored, and up to 0.04 mm. in diameter; tracheæ about 0.009 mm. in width with spiral and annular markings; prisms or rosette aggregates of calcium oxalate from 0.002 to 0.004 mm. in diameter.

Calendula yields not more than 11 per cent. of ash.

CANELLA

Canella

Canell.

The dried inner bark of *Canella Winterana* (Linné) Gaertner (Fam. *Canellaceæ*.)

In quills usually from 1 to 3 dm. in length and from 1 to 4 cm. in thickness, occasionally two or three times this size, or in irregular fragments of quills, from 1.5 to 5 mm. in thickness and 2 to 3 cm. in width, the outer periderm mostly removed; outer surface light brownish-yellow or pale orange-brown, more or less scaly, with a few very shallow fissures, often more or less reticulate with slight ridges; inner surface paler, somewhat smooth, but showing coarse, longitudinal striæ; fracture short and sharp, pale yellow, with an irregular, slightly darker band just inside of the center. Odor slight unless the bark is heated, then aromatic, resembling that of cinnamon; taste aromatic, warm, somewhat bitter and mucilaginous.

The powdered drug is light brown to brownish-red and, when examined under the microscope, exhibits numerous, isodiametric, thick-walled stone cells about 0.075 mm. in diameter, the walls with simple or branching pores; calcium oxalate in rosette aggregates up to 0.05 mm. in diameter; starch grains simple or two- to three-compound up to 0.02 mm. in diameter; oil cells with suberized walls numerous.

Canella yields not more than 7 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

CARAMEL

Caramel

Caram. Saccharum Ustum Burnt Sugar Coloring

A concentrated aqueous solution of the product obtained by heating sugar or glucose until the sweet taste is destroyed and a uniform dark brown mass results, a small amount of alkali or alkali carbonate being added while heating.

Caramel is a thick, dark brown liquid having the characteristic odor of burnt sugar and a pleasant, bitter taste.

Caramel mixes clear with water in all proportions, 1 part dissolved in 1000 parts of distilled water yielding a clear solution having a distinct sepia tint. The color of this solution is not changed and no precipitate is formed after exposure to sunlight for six hours. It is soluble in diluted alcohol, but is precipitated when the alcoholic content of the solution is increased to 80 per cent., by volume, or more. It is insoluble in ether, chloroform, acetone, benzene, petroleum benzin, or oil of turpentine.

Specific gravity: not less than 1.35 at 25° C.

Spread a thin layer of Caramel on a glass plate; it appears homogeneous, reddish-brown and transparent.

No precipitate is produced in 20 mils of an aqueous solution of Caramel (1 in 20) on the addition of 0.5 mil of phosphoric acid.

Caramel swells when incinerated and forms a coke-like charcoal, which burns off only after prolonged heating at a high temperature, and yields not more than 8 per cent. of ash.

CARMINUM

Carmine

Carmin.

The aluminum lake of the coloring principle obtained from cochineal. Preserve it in well-stoppered, amber-colored bottles, protected from light.

It occurs in irregular, angular, bright red fragments or as a powder, without odor or taste. When burned, Carmine emits an odor resembling that of burned feathers.

Slightly soluble in water to which it imparts a red color; freely soluble in ammonia water and alkaline liquids, forming a dark purplish-red solution.

The yield of ash does not exceed 12 per cent.

Fuse the ash from 1 Gm. of Carmine with 1 Gm. of sodium cyanide, dissolve the fused mass in hydrochloric acid with the addition of a few drops of nitric acid, then dilute it with distilled water to 30 mils and filter the solution. Separate portions of 10 mils each of this solution yield no precipitate with hydrogen sulphide T.S. or with sulphuric acid (*tin, lead and soluble barium compounds*).

Fuse the ash from 1 Gm. of Carmine with a mixture of 1 Gm. of sodium cyanide and 1 Gm. of potassium carbonate, extract the fused mass with boiling distilled water, filter, wash with hot distilled water and dissolve the residue in diluted hydrochloric acid; this solution does not become turbid on the addition of a few drops of sulphuric acid (*barium sulphate*).

CASCARILLA

Cascarilla

Cascarill. Sweetwood Bark Sweet Bark

The dried bark of *Croton Eluteria* (Linné) Bennett (Fam. *Euphorbiaceæ*), without the presence of more than 5 per cent. of adhering wood.

In quills or curved pieces from 0.5 to 2.5 mm. in thickness, externally gray, somewhat fissured; the corky layer easily detached, more or less coated with a white lichen; the uncoated surface dull-brown, inner surface smooth; fracture short, the fractured surface having a resinous and radially striate appearance. Odor characteristic, strong and musk-like when the bark is burned; taste warm, aromatic and very bitter.

The powdered drug is pale-brown and has an odor resembling that of clove. When examined under the microscope, it exhibits simple starch grains up to 0.013 mm. in diameter and occasionally two- to three-compound; calcium oxalate in monoclinic crystals or rosette aggregates up to 0.025 mm. in diameter; fragments of parenchyma tissue, some of the cells containing starch, calcium oxalate or tannin; cells filled with reddish-brown resin or yellow oil; somewhat lignified cork cells, polygonal in outline with evenly thickened, lamellated walls and irregular lumina; non-porous bast fibers, some with lignified walls, up to 0.016 mm. in diameter; tracheæ with bordered pores very few or absent.

Cascarilla yields not more than 10 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

CASSIA FISTULA

Cassia Fistula

(U.S.P. VIII)

Cass. Fist. Purging Cassia

The dried fruit of *Cathartocarpus Fistula* (Linné) Persoon (Fam. *Leguminosæ*).

Cylindrical, from 25 to 50 cm. in length, about 20 mm. in diameter, chestnut-brown in color, on one side a longitudinal groove and on the other a smooth line or slight ridge, indicating the sutures; indehiscent, the cavity divided transversely into numerous compartments, each containing a reddish-brown, glossy, flattish-ovoid seed embedded in a blackish-brown sweet pulp. Odor resembling that of prunes.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 60 grains.

CASTANEA

Castanea

Castan. Chestnut Leaves

The dried leaves of *Castanea dentata* (Marshall) Borkhausen (Fam. *Fagaceæ*), collected in September or October while still green, and without the presence of more than 5 per cent. of twigs or other foreign matter.

Petioles stout, about 12 mm. in length; blades entire or slightly broken and usually folded or matted together; about 15 to 25 cm. in length and about 5 cm. in breadth, oblong-lanceolate, apex attenuate, acute at the base, coarsely and sharply serrate with ascending, attenuate teeth, nearly smooth, coriaceous in texture, the upper

surface dark green, the lower light green; distinctly pinnately veined, the veins of the first order diverging at an angle of about 60 degrees, each terminating in one of the teeth. Odor slight; taste astringent.

The powdered drug, when examined under the microscope, shows a few non-glandular hairs from 0.1 to 0.5 mm. in length, nearly smooth, thick-walled, distinctly yellow, occasionally in groups of three to eight and spreading from the base; numerous calcium oxalate crystals in rosette aggregates or in monoclinic prisms, from 0.01 to 0.04 mm. in diameter; parenchyma cells containing irregular yellowish-brown tannin masses which are colored blue with ammonio-ferric alum T.S.

Castanea yields not more than 5 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

CATARIA

Catnep

Catar. Catmint

The dried leaves and flowering tops of *Nepeta Cataria* Linné (Fam. *Labiatæ*).

Tops, when whole, from 10 to 20 cm. in length, much branched, commonly crushed and broken; stems quadrangular, downy; leaves opposite, those of the stem petiolate, from 2 to 7 cm. in length, rounded heart-shaped at the base, oblong, pointed at the apex, pale gray-green, soft-hairy above, downy beneath, margin deeply crenate, floral leaves small, bract-like; flowers small, in dense, interrupted spikes; calyx hairy, tubular, curved obliquely and sub-equally five-toothed; corolla whitish, dotted with purple, throat dilated, limb bilabiate, the upper lip erect, two cleft, lower spreading, three cleft, the middle lobe largest, crenulate; stamens two pairs ascending under the upper lip, lower pair shorter. Odor faintly aromatic and mint-like; taste bitter, pungent and aromatic.

Catnep yields not more than 16 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

CAULOPHYLLUM

Caulophyllum

Caulophyl. Blue Cohosh Papoose Root Squaw Root

The dried rhizome and roots of *Caulophyllum thalictroides* (Linné) Michaux (Fam. *Berberidaceæ*).

Rhizome of horizontal growth, from 7 to 25 cm. in length and from 5 to 15 mm. in thickness, much branched, slightly compressed from above, bearing large, cup-shaped stem scars on the upper surface, underneath a tangled or matted mass of long, curved, thin, tough roots which frequently conceal the rhizome; both rhizome and roots of a grayish or yellowish-gray color; fracture tough and woody. Odorless but sternutatory; taste bitter-sweet and acrid.

The powdered drug is light brown and, when examined under the microscope, it exhibits numerous starch grains, spherical in outline, mostly simple, up to 0.016 mm. in diameter; fragments of cork with cells about 0.05 mm. in diameter and having yellowish-brown walls; tracheæ with bordered pores, the cells being up to 0.05 mm. in width; wood fibers with heavily lignified walls; fragments of parenchyma tissue with many of the cells containing starch grains.

Caulophyllum yields not more than 6 per cent. of ash.

AVERAGE DOSE—Metric, 0.5 Gm.—Apothecaries, 8 grains.

CENTAURIUM

Centaury

Centaur.

The dried flowering plant of *Erythraea Centaurium* (Linné) Persoon (Fam. *Gentianaceæ*).

Glabrous, from 1.5 to 5 dm. in height, much branched from the base, but little branched, if at all, from above; stems slender, sharply angled or narrowly winged, sparsely leafy; leaves opposite, entire, mostly three-nerved, sessile, those at the base obovate and obtuse, from 2 to 5 cm. in length, their base narrowed and petiole-like, those of above gradually changing to oval, then ovate or even lance-linear, acute; flowers in a terminal and at length compound cyme, rose-colored; calyx from 5 to 7 mm. in length, deeply five-parted, the tube short, sharply angled, lobes linear-attenuate with a sharp midrib; corolla tube nearly twice the length of the calyx, slender; the limb from 10 to 15 mm. in breadth, its lobes broadly oblong or oval; stamens five, exserted, bright-yellow, their anthers twisted when old; pistil two-carpelled. Odor faint but characteristic; taste persistently bitter.

Centaury yields not more than 5 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

CEREVISIÆ FERMENTUM COMPRESSUM

Compressed Yeast

Cerev. Ferm. Compr.

The moist, living cells of *Saccharomyces cerevisiæ* Meyen (Fam. *Saccharomycetaceæ*) or of other species of *Saccharomyces*, combined with a starchy or absorbent base.

White or yellowish-white, soft and easily broken masses, having a characteristic, slightly sour odor, and not more than a faintly acid reaction to litmus.

When examined under the microscope, numerous oidium and mycoderma cells and starch grains are visible.

Compressed yeast must not be used unless fresh, and free from mildew and musty or foul odors.

CHIMAPHILA

Chimaphila

(U.S.P. VIII)

Chimaph. Pipsissewa

The dried leaves of *Chimaphila umbellata* (Linné) Barton (Fam. *Ericaceæ*), without the presence of more than 5 per cent. of stems or other foreign matter.

Oblanceolate, from 2.5 to 7 cm. in length and from 8 to 20 mm. in breadth, the upper portion coarsely and sharply serrate, acute or somewhat obtuse, the lower wedge-shaped and nearly entire; coriaceous, smooth and uniformly dark green on the upper surface, paler beneath, the veins prominent. Odor slight; taste astringent and bitter.

The powdered drug is brownish-green and, when examined under the microscope, exhibits characteristic epidermal tissue composed of cells with unevenly thickened, porous, and wavy vertical walls; the fragments from the lower epidermis show numerous broadly elliptical stomata up to 0.04 mm. in length, the epidermal tissue in transverse view shows outer walls from 0.008 to 0.015 mm. in thickness; fragments

of palisade and mesophyll tissue containing chloroplastids; tracheæ with spiral or annular markings; a few characteristic, elongated trachea-like cells, about 0.014 mm. in width, thick-walled, slightly lignified and with minute, double-spiral bands or delicate reticulations; fragments of the epidermis from the stems and root-stocks, the cells containing a purplish coloring substance which is intensified when the powder is mounted in hydrated chloral T.S.; parenchyma cells containing a reddish-brown amorphous substance; calcium oxalate in rosette aggregates mostly about 0.035 mm. in diameter, occasionally up to 0.065 mm. in diameter; starch grains few, rounded, simple, up to 0.016 mm. in diameter and sometimes with a central cleft or fissure, or two- to four-compound; trichomes absent.

Chimaphila yields not more than 7 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

CHIONANTHUS

Chionanthus

Chionant. Fringe Tree Bark

The dried bark of the root of *Chionanthus virginica* Linné (Fam. *Oleaceæ*), without the presence of more than 8 per cent. of other parts of the plant or other foreign matter.

Usually in transversely curved pieces, occasionally in single quills from 1 to 10 cm. in length; bark from 2 to 10 mm. in thickness; heavy, some pieces of the whole drug sinking when thrown into water; outer surface usually reddish-brown, occasionally grayish-brown, with few transverse wrinkles, whitish cork patches and root-scars; inner surface yellowish-brown, more or less striate and undulate; fracture short, hard, and coarsely granular, due to projecting groups of stone cells; the broken surface of a light yellowish-white color. Odor characteristic; taste bitter.

The powdered drug is light brown and, when examined under the microscope, exhibits somewhat rounded, simple or two- to four-compound starch grains, the individual grains mostly 0.003 to 0.025 mm. in diameter; numerous stone cells, in groups and isolated, the walls thick, strongly lignified and with simple and branching pores; brown resin masses; fragments consisting of light brown, thin-walled cork cells; parenchyma tissue with many of the cells filled with starch grains.

Chionanthus yields not more than 5 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

CHIRATA

Chirata

(U.S.P. VIII)

Chirat.

The dried plant of *Swertia Chirayita* (Roxburgh) Hamilton (Fam. *Gentianaceæ*).

Smooth, root simple, about 7 mm. in thickness near the crown, stem about 1 M. in length, externally yellowish- or purplish-brown; cylindrical near the base, quadrangular and slightly winged above, with numerous opposite, ascending branches; wood yellowish, thin, enclosing usually a large yellowish easily separable pith; leaves opposite, sessile, ovate-lanceolate, entire, five-nerved, about 6 cm. in length; flowers numerous, panicled, small, with a four-lobed calyx and corolla, capsule ovoid, acute, one-celled, many-seeded. Odor slight; taste intensely bitter.

Chirata yields not more than 6 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

COCCULUS INDICUS

Cocculus Indicus

Coccul. Ind. Fish Berry Indian Berry

The dried fruit of *Anamirta Cocculus* (Linné) Wight et Arnott (Fam. *Menispermaceæ*).

Reniform, about 10 mm. in length and 6 mm. in breadth and thickness, blackish-brown, wrinkled; hilum and micropyle close together, separated by a shallow sinus and connected by an obscure ridge running around the convex side. Seed urn-shaped, its longitudinal and transverse sections crescent-shaped. Taste slightly bitter; the seed whitish-yellow and intensely bitter.

Cocculus Indicus yields not more than 5 per cent. of ash.

COCILLANA

Cocillana

Cocillan.

The dried bark of *Guarea Rusbyi* (Britton) Rusby (Fam. *Meliaceæ*).

In flat or curved pieces of variable size and from 3 to 5 mm. in thickness; outer surface shallowly or deeply fissured, according to age and thickness, gray-brown, often ashy-gray from lichen growths, or of a deeper brown where the cork has been removed; inner surface of medium brown color, strongly and coarsely longitudinally striate, the striæ straight or wavy; inner bark usually much thicker than the outer, its fracture coarsely splintery-fibrous. Odor characteristic; taste slightly astringent, peculiar and slightly nauseous.

Cocillana yields not more than 10 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

COFFEA TOSTA

Coffee

Coff. Tost. Roasted Coffee

The dried ripe seeds of *Coffea arabica* Linné or *Coffea liberica* Bulliard (Fam. *Rubiaceæ*), roasted until they develop a dark brown color and a characteristic aroma, and yielding not less than 1 per cent. of caffeine.

Oval, of variable size, having one side strongly convex, the other flat with a longitudinal groove, and showing traces of the papery seed coat in the cleft. It has a characteristic aroma and a pleasantly bitter taste.

Percolate 1 Gm. of powdered Coffee with ether until exhausted and evaporate the percolate to dryness; the residue weighs not less than 0.1 Gm. (presence of at least *10 per cent. of fat*).

Boil 1 Gm. of powdered Coffee with 10 mils of distilled water, filter and acidify the filtrate with 1 mil of diluted sulphuric acid, and then decolorize it by the cautious addition of potassium permanganate T.S. This decolorized solution shows no blue coloration upon the addition of iodine T.S. (*starch*).

Shake 1 Gm. of Coffee with 20 mils of water; the strained liquid shows no colored or heavy deposit. Shake 1 Gm. of Coffee with 20 mils of alcohol; the strained liquid shows no colored or heavy deposit, nor is any color imparted to the alcohol (*artificial colors or facings*).

Powdered Coffee, when examined under the microscope, exhibits numerous fragments of the seed coat made up of parenchyma and irregular stone cells, the latter from 0.2 to 1 mm. in length and from 0.015 to 0.05 mm. in width, with walls having simple pores; numerous brownish endosperm cells having porous walls about 0.01 mm. in thickness and containing oil and aleurone grains; starch grains few or absent.

Coffee yields not less than 3 per cent. nor more than 5 per cent. of ash.

Assay.—To 6 Gm. of Coffee, in No. 60 powder, contained in a small flask, add 50 mils of purified petroleum benzin and agitate the mixture occasionally during one hour. Then allow it to settle and decant the benzin solution. Add 50 mils more of the petroleum benzin, shake the mixture occasionally during fifteen minutes, then filter off the benzin and dry the drug. Now transfer the Coffee residue to a bottle having a capacity of about 250 mils and pour upon it 120 mils of chloroform and 6 mils of ammonia water. Stopper the bottle securely and shake it vigorously at intervals during six hours. Then allow it to stand one hour, and filter off 100 mils of the chloroform solution. Transfer this to a beaker and evaporate the chloroform at a gentle heat. Dissolve the alkaloidal residue in 10 mils of a mixture of 1 mil of diluted sulphuric acid and 9 mils of distilled water, by aid of a gentle heat, and filter the solution through a small filter, not exceeding 5 cm. in diameter, into a separator. Wash the beaker and filter with successive small portions of acidulated water, until a few drops of the filtrate give no test for caffeine when tested with iodine T.S. To the mixed acid washings, add a slight excess of ammonia water, and shake out the caffeine with successive portions of chloroform, collecting the chloroformic solutions in a tared flask or beaker. Evaporate or distil off the chloroform at a temperature not exceeding 75° C. and add to the residue 5 mils of ether. Evaporate off the ether cautiously, then dry the residue to constant weight at a temperature not exceeding 80° C. and add 0.0025 Gm. to the final weight of caffeine to replace that lost in the petroleum benzin washing. The weight represents the amount of caffeine in 5 Gm. of Coffee.

CONDURANGO

Condurango

Conduran.

The dried bark of *Marsdenia Condurango* (Triana) Reichenbach filius (Fam. *Asclepiadaceæ*).

In quills or transversely curved pieces, usually from 4 to 13.5 cm. in length; bark 1 to 6 mm. in thickness; outer surface light grayish-brown to dark brown, nearly smooth and with numerous lenticels, or more or less scaly and considerably roughened; the scales soft, occasionally with brownish-black apothecia of a fungus; inner surface grayish-white or light brown, longitudinally striate; fracture short-fibrous and granular. Odor slightly aromatic, especially marked in the fresh drug; taste bitter and aromatic.

Under the microscope, sections of Condurango show a corky layer consisting of several rows of thin-walled cells, frequently with yellowish-brown contents; a layer of phelloderm of eight to ten rows of cells, containing starch grains and membrane crystals of calcium oxalate, the latter in prisms, from 0.01 to 0.035 mm. in length; a primary cortex of collenchyma containing chloroplastids, starch grains, or rosette aggregates of calcium oxalate, from 0.015 to 0.04 mm. in diameter; a pericycle or pericambium of tangentially elongated parenchyma cells, with groups of bast fibers and laticiferous vessels in an interrupted circle; middle bark with large groups of stone cells varying from nearly isodiametric to elongated, sometimes very irregular

in form; inner bark with medullary rays one or two cells in width, numerous laticiferous cells accompanied by small groups of sieve cells, parenchyma containing either starch grains or rosette aggregates of calcium oxalate, and an occasional isolated bast fiber or small group of stone cells.

The powder is light yellowish-brown, consisting chiefly of groups of stone cells and parenchyma containing calcium oxalate crystals and starch grains; stone cells chiefly in large groups, the individual cells being more or less irregular in shape and with very thick porous walls, the lumina being usually filled with air; calcium oxalate chiefly in rosette aggregates, occasionally in single prisms, mostly from 0.015 to 0.02 mm. in diameter; starch grains mostly simple, frequently two- to four-compound the individual grains being from 0.003 to 0.015 mm. in diameter; bast fibers non-lignified; very long and from 0.01 to 0.035 mm. in width; fragments of thin-walled latex tubes from 0.015 to 0.025 mm. in diameter and filled with a granular substance; fragments of cork grayish or light yellowish-brown.

Macerate 1 Gm. of the powdered bark in 5 mils of cold water; filter and heat the filtrate in a test tube; it becomes cloudy, but on cooling assumes its original transparency.

Condurango yields not more than 12 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

CONIUM

Conium

(U.S.P. VIII)

Poison Hemlock

The full grown, but unripe fruit of *Conium maculatum* Linné (Fam. *Umbelliferæ*), carefully dried and preserved, and yielding not less than 0.5 per cent. of coniine. After being kept for more than two years, Conium is unfit for use.

Broadly ovoid, greenish-gray, the two mericarps of most of the fruits separated, each about 3 mm. in length and about 1.5 mm. in diameter, ovoid, somewhat curved, the inner, flattened side marked by a deep longitudinal groove, the outer, convex side with five, pale yellow, somewhat crenate ribs, the intervening surfaces wrinkled but otherwise smooth; pericarp without oil tubes. Odor slight, but when triturated with a solution of potassium hydroxide, strong, disagreeable, and mouse-like; taste characteristic, disagreeable, afterwards somewhat acrid.

Transverse sections of the mericarp, when examined under the microscope, exhibit a pentangular outline, the angles projecting and forming the ribs, four of the sides being almost equal in length, the fifth or commissural side being about twice as long as one of the dorsal sides and usually concave near the middle; a distinct fibro-vascular bundle at each angle composed of thick-walled fibers about 0.013 mm. in diameter and a few tracheæ; epidermis consisting of one layer of cells which are sometimes slightly centrifugally developed, hairs are absent; pericarp thin, without vittæ, enclosing a single seed and extending inwardly on the commissural side for about one-third the diameter of the section; the inner epidermis of the pericarp composed of two layers of cells with yellowish-brown walls, the outer layer with cells from 0.06 mm. to 0.12 mm. in tangential length and with thickened radial and inner walls, the inner layer with thin-walled cells from 0.03 to 0.06 mm. in tangential length and about 0.03 mm. in radial diameter; the seed coat composed of small, thick-walled cells about 0.015 mm. in radial diameter; often obliterated; a large endosperm or central portion being somewhat pentangular-rounded in outline, with a deep channel on the commissural side and composed of polygonal parenchyma cells; the latter contain globules of fixed oil and aleurone grains with rosette aggregates of calcium oxalate.

The powdered drug is greenish-gray and, when examined under the microscope, exhibits numerous angular or rounded, light colored fragments of endosperm tissue, composed of parenchyma cells containing fixed oil, aleurone grains and rosette aggregates of calcium oxalate, the latter from 0.002 to 0.006 mm. in diameter; a few more or less curved groups of lignified fibers; fragments of the seed coat with yellowish-brown walls; a few rounded starch grains about 0.005 mm. in diameter; spiral or annular tracheæ few; numerous oil globules on mounting the powder in hydrated chloral T.S.

Conium yields not more than 8 per cent. of ash.

Assay.—Place 15 Gm. of Conium, in No. 40 powder, in a 250 mil Erlenmeyer flask, add 150 mils of purified petroleum benzin and then 15 mils of solution of sodium hydroxide, insert the stopper securely, and shake the flask vigorously at frequent intervals during six hours. Allow the mixture to settle and decant 100 mils of the clear benzin solution (representing 10 Gm. of the drug) into a separator; extract the alkaloid by shaking with successive portions of weak hydrochloric acid until a few drops of the last washing gives no precipitate with iodine T.S. Collect the acid washings and concentrate by evaporation on a water bath to 10 mils, cool and transfer the liquid to a separator, then cautiously add sodium carbonate in excess. Extract the alkaloid by shaking out with successive portions of 15 mils each of purified petroleum benzin. Separate the benzin washings and filter into a beaker. Then add exactly 10 mils of tenth-normal sulphuric acid V.S. and stir thoroughly for two minutes so as to mix the acid and benzin solution. Evaporate the benzin layer in a current of warm air, at a temperature not exceeding 60° C., and as soon as the benzin has disappeared, cool, add five drops of cochineal T.S. or methyl red T.S. and titrate the acid solution with fiftieth-normal potassium hydroxide V.S. Each mil of tenth-normal sulphuric acid V.S. consumed corresponds to 0.0126 Gm. of coniine. Calculate the amount of coniine neutralized by the acid, and multiply the result by ten to obtain the percentage of coniine in the drug.

Average dose—Metric, 0.2 Gm.—Apothecaries, 3 grains.

CONVALLARIÆ FLORES

Convallaria Flowers

Convallar. Flor. Lily-of-the-Valley Flowers

The dried inflorescence of *Convallaria majalis* Linné (Fam. *Liliaceæ*), without the presence of more than 5 per cent. of foreign matter.

From 15 to 25 cm. in length, peduncle dull-green or suggesting purplish-green, and more or less angled; flowers white, when old drying to a brownish color, usually from ten to twenty in number, borne in a more or less secund raceme on recurved pedicels which are usually from a half longer than their flowers to twice their length, each pedicel subtended by a whitish, ovate, acute bract about half its length; flowers from 6 to 8 mm. in length and rather broader, bell-shaped, six-parted, the segments ovate, obtuse, and slightly recurved; stamens six, included, adnate to the base of the corolla; style columnar, three-grooved. Odor agreeable; taste sweetish, then somewhat acrid.

The powdered drug is light yellowish-brown and, when examined under the microscope, exhibits ellipsoidal or nearly spherical pollen grains with a smooth exine layer and occasionally with a convex rupture through the walls; calcium oxalate in raphides up to 0.04 mm. in length; fragments of tissue from the corolla composed of nearly isodiametric parenchyma cells with broadly elliptical stomata up to 0.04 mm. in length; fragments from the anther lobes, many of the cells having reticulate walls; few fragments of the short filaments with cells containing calcium oxalate; fragments of the stigma, rough and warty, with adhering pollen grains; portions of the bracts composed of thin-walled elongated cells, a few vascular bundles and stomata; tissue of the peduncle and pedicel composed of fragments of the epidermis with cells tapering

at each end about 0.20 mm. in length and 0.03 mm. in breadth with elliptical stomata between the ends; sub-epidermal cells with yellowish-green plastids; tracheæ about 0.021 mm in width, spiral and with simple pores; sclerenchymatous fibers few, with lignified walls and simple pores.

Convallaria Flowers yield not more than 12 per cent. of ash.

AVERAGE DOSE—Metric, 0.5 Gm.—Apothecaries, 8 grains.

CONVALLARIÆ RADIX

Convallaria Root

(U.S.P. VIII)

Convallar. Rad. Lily-of-the-Valley Root

The dried rhizome and roots of *Convallaria majalis* Linné (Fam. *Liliaceæ*).

Rhizome horizontal, elongated, usually branched, cylindrical, variable in length, from 1 to 3 mm. in diameter; externally yellowish-white or pale brown, with a few circular stem scars, and from the under and side portions at the nodes usually arise from three to five thin, tortuous, dark brown, branching roots; fracture short or fibrous; internally whitish. Odor faint; taste sweetish, becoming bitter and acrid.

Under the microscope, transverse sections of the rhizome of Convallaria Root show an epidermal layer with a thick outer layer of cutin; a hypodermal layer of a single row of collenchyma; a cortex made up of about twenty rows of parenchyma cells, some of which contain starch and raphides of calcium oxalate; a prominent endodermis, the radial and inner walls of which are strongly thickened and lignified; inside the endodermis is an interrupted circle of collateral fibro-vascular bundles, the woody portion of which has in cross section the shape of the letter V; inside the circle of bundles is another interrupted circle of fibro-vascular bundles of the concentric type, the sieve tissue being surrounded by the xylem; the parenchyma cells of the pith separated by large intercellular spaces.

Under the microscope, transverse sections of the root of Convallaria show a hairy epidermal layer, a hypodermis of a single row of cells; a cortex of about six rows of cells, some of which contain starch, raphides of calcium oxalate, and oil; the cells of the endodermal layer resemble those of the rhizome; fibro-vascular bundles mostly five.

The powder is dark brown, tending to cake on standing, consisting chiefly of cellular fragments and a few starch grains and raphides of calcium oxalate; cells of endodermis with slightly oblique ends and considerably thickened, lignified porous walls; fragments of tracheæ with spiral and scalariform thickenings, or with porous walls; starch grains single or compound, mostly nearly spherical, and from 0.003 to 0.012 mm. in diameter; raphides of calcium oxalate few, from 0.02 to 0.045 mm. in length.

Convallaria Root yields not more than 10 per cent. of ash.

AVERAGE DOSE—Metric, 0.5 Gm.—Apothecaries, 8 grains.

COPTIS

Coptis

Goldthread

The dried plant of *Coptis trifolia* (Linné) Salisbury (Fam. *Ranunculaceæ*).

In loose, matted masses consisting of long, much branched rhizomes and their small roots, together with the leaves. Rhizomes orange or golden-yellow; leaves evergreen, long and slenderly petioled, trifoliate, the segments broadly obovate-

cuneate, crenately lobed and toothed with sharp-pointed teeth, prominently veined, smooth, coriaceous, dark green and shining but often drying to a dull brownish hue; flowers, if present, small, solitary, terminating slender scapes, sepals five to seven, oblong, obtuse, deciduous; petals five to six, pale yellow, small club shaped; stamens numerous. Odor faint; taste purely bitter without astringency.

The powdered drug is yellowish-green and, when examined under the microscope, exhibits numerous, mostly simple, starch grains, somewhat rounded, up to 0.007 mm. in diameter; fragments of leaf epidermis, composed of cells with wavy vertical walls and broadly elliptical stomata, the latter up to 0.024 mm. in length; fragments of the nerved scales from the nodes, composed of cells with yellow walls; leaf parenchyma cells containing chloroplastids; few, simple, thick-walled hairs from the midrib of the leaf, from 0.035 to 0.075 mm. in length; elongated, epidermal cells from the roots having yellow walls and filled with reddish contents; fragments of epidermal and sub-epidermal cells from the rhizome, similar to those from the root, but without reddish contents, often filled with a yellowish content; groups of elongated parenchyma cells about 0.06 mm. in length and about 0.01 mm. in width, many being filled with starch grains; tracheæ with bordered pores or spiral markings, about 0.02 mm. in width; narrow thin-walled, porous sclerenchyma fibers.

Coptis yields not more than 8 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

CORNUS

Cornus

Corn. Dogwood Bark

The dried bark of the root of *Cornus florida* Linné (Fam. *Cornaceæ*).

In irregular, chip-like pieces, or portions of quills, usually less than 5 cm. in length and from 1 to 4 mm. in thickness; externally of a dingy-brown color, lightly fissured and thinly scaly, or reddish where the corky layer has been removed; inner surface varying from pinkish-brown to red-purple, usually harsh to the touch from numerous short striæ; fracture short, the surface whitish with yellow striæ, except the inner layer, which is light purple. Odor slight; taste bitter and astringent.

Cornus yields not more than 10 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

CORYDALIS

Corydalis

Coryd. Turkey Corn Squirrel Corn

The dried tubers of *Bicuculla canadensis* (Goldie) Millspaugh, usually somewhat mixed with the dried bulb-like portions of *Bicuculla Cucullaria* (Linné) Millspaugh (Fam. *Fumariaceæ*), and without the presence of more than 5 per cent. of other parts of the plants or other foreign matter.

The tubers are spheroidal and frequently vertically depressed, the flattened surface more or less concave, up to 15 mm. in diameter; usually single, rarely two or more in a cluster; externally, minutely pitted or nearly smooth; grayish-brown, grayish-black, or amber-colored and more or less translucent; one of the flattened surfaces with a triangular scar from detached roots, the other usually with remains of the

slender rhizome; fracture, hard and horny, exhibiting a yellowish, waxy interior, or somewhat tough and granular, exhibiting a yellowish-white interior.

The grains of the granulate bulb of *Bicuculla Cucullaria* are ovoid or triangular-ovoid and up to 12 mm. in length; the larger grains distinctly concave on one surface, with a scar at the apex from the detached petiole, and usually attached to the short root-stock in clusters of three; the smaller grains usually separated from the root-stock, with an acute apex and a scar at the base; externally, yellowish- or grayish-brown, usually translucent; fracture hard and horny, exhibiting a grayish, waxy interior, or granular and tough, exhibiting a whitish interior. Nearly odorless; taste slightly bitter.

The powdered drug is light yellow or yellowish-gray and, when examined under the microscope, exhibits numerous oval, ovoid or oblong, simple starch grains, the broad end of the grain sometimes truncate, up to 0.06 mm. in length and frequently with a cleft or horseshoe-shaped fissure in the small end of the grain; occasionally in two-compound grains; altered starch grains up to 0.09 mm. in length; numerous angular or rounded parenchyma cells isolated or in groups and containing more or less altered starch grains the outlines of which are indistinct; tracheæ few with reticulate, simple pores, annular or spiral markings; fragments of epidermal cells with thin brownish walls; sclerenchyma fibers very few or absent; few characteristic sclerotic cells from the root-stock of *Bicuculla Cucullaria*, irregular in outline, mostly elongated up to about 0.75 mm. in length and 0.1 mm. in width, walls heavily lignified and about 0.02 mm. in thickness and porous, occurring isolated or in groups of from two to four; very few sclerotic cells from the rhizome of *Bicuculla canadensis*, mostly isodiametric, uniformly smaller than in *Bicuculla Cucullaria* and with walls about 0.012 mm. in thickness, not distinctly irregular in outline; very few rosette aggregates of calcium oxalate, up to 0.02 mm. in diameter, from the portions of rhizome of *Bicuculla canadensis*.

An infusion prepared by placing 5 Gm. of powdered Corydalis in 100 mils of hot distilled water, stirring occasionally during ten minutes and then filtering, is of a light amber color, and gives a precipitate with potassio-mercuric iodide T.S. and a dark blue color with iodine T.S.

Corydalis yields not more than 8 per cent of ash.

AVERAGE DOSE—Metric, 0.65 Gm.—Apothecaries, 10 grains.

COUMARINUM

Coumarin

Coumar.

The anhydride [$C_6H_4(CH)_2OCO = 146.05$] of ortho-oxycinnamic acid, occurring naturally in Tonka, Melilot and other plants, or prepared synthetically.

Coumarin occurs in colorless, prismatic crystals, having a characteristic, fragrant odor and a bitter, aromatic and burning taste.

Sparingly soluble in cold water, more readily soluble in hot water, freely soluble in alcohol, ether, or chloroform; also soluble in fixed or volatile oils.

When heated to between 67° and 68° C. it melts, and at about 100° C. it commences to sublime; at from 290° to 291° C. it boils without decomposition.

Coumarin dissolves in solution of sodium or potassium hydroxide, producing a yellow color and forming sodium or potassium coumarate, from which carbon dioxide precipitates the Coumarin. Coumarin is precipitated in colorless needles on the addition of hydrochloric acid to its hot concentrated sodium or potassium hydroxide solution.

A saturated aqueous solution of Coumarin forms a precipitate upon the addition of iodine T.S. The precipitate is at first brown and flocculent and afterwards, on shaking, clots together, forming a dark green curdy mass and leaving the liquid clear (distinction from *vanillin*).

Coumarin is not extracted from its solution in ether by ammonia water (distinction from *vanillin*).

Warm 0.1 Gm. of Coumarin with 1 mil of an alcoholic solution of sodium hydroxide (1 in 4), add a few drops of chloroform and again warm; the mixture does not possess the disagreeable odor of phenyl-isocyanide (*acetanilid*).

CROCUS

Saffron

Croc.

The stigmas of *Crocus sativus* Linné (Fam. *Iridaceæ*), without the presence of more than 10 per cent. of the yellow styles or other foreign matter. Preserve it in tightly-closed containers protected from light.

Stigmas 3, united or separate, attached to the summit of the style; usually about 25 mm. in length, cornucopia-shaped, of a dark, rich red color, the margin dentate or fimbriate; styles about 10 mm. in length, more or less cylindrical, solid, yellowish. Odor strong, peculiarly aromatic; taste bitterish, aromatic. When chewed it colors the saliva orange-yellow.

Under the microscope, the upper end of the stigma shows numerous cylindrical papillæ about 0.15 mm. in length, among which occur a few spherical pollen grains, the latter being nearly smooth, and from 0.04 to 0.07 mm. in diameter; occasionally some of the pollen grains have germinated and show pollen tubes.

When placed in sulphuric acid, the stigmas are immediately colored blue, gradually changing to violet, and finally become a deep wine-red color.

Add 0.01 Gm. of finely powdered Crocus to 100 mils of cold water, allow it to macerate for several hours and filter; on adding 10 mils of this filtrate to 100 mils of water, it gives a distinctly yellow-colored solution.

Macerate 0.01 Gm. of Crocus in 5 mils of methyl alcohol; a deep orange color is imparted to the liquid. Macerate 0.01 Gm. of Crocus in 5 mils of acetone, alcohol, or dehydrated alcohol; a distinct, lemon-yellow color is produced. With corresponding quantities of Crocus and ether a very light lemon-yellow color is produced. With corresponding quantities of Crocus and chloroform a very slight, yellow tinge is imparted; and with corresponding portions of Crocus and xylene, benzene, carbon disulphide, or carbon tetrachloride, the solvents remain colorless.

When Crocus is pressed between filter paper, the paper does not display transparent spots due to the absorption of oil.

It loses not more than 14 per cent. of its weight when dried at 100° C.

Crocus yields not more than 7.5 per cent. of ash and the ash is not fusible.

CYPRIPEDIUM

Cypripedium

(U.S.P. VIII)

Cypriped. Lady Slipper Root

The dried rhizome and roots of *Cypripedium hirsutum* Miller, *Cypripedium pubescens* Willdenow, or of *Cypripedium parviflorum* Salisbury (Fam. *Orchidaceæ*), without the presence of more than 5 per cent. of other parts of the same plants or other foreign matter.

Rhizome of horizontal growth, curved, from 3 to 10 cm. in length, and from 2 to 6 mm. in thickness, orange-brown to dark-brown, the upper side showing numerous circular, cup-shaped scars, closely covered below with simple, wiry roots, varying from 3 to 15 cm. in length; fracture of rhizome short, white, that of roots somewhat fibrous. Odor distinct, heavy; taste sweetish, bitter, and somewhat pungent.

The powdered drug is yellowish-brown and, when examined under the microscope, exhibits numerous rounded or somewhat angular, simple and compound starch grains up to 0.014 mm. in diameter; calcium oxalate in raphides up to 0.065 mm. in length and occurring isolated or in bundles, occasionally imbedded in a mucilage-like plasma; tracheæ spiral, scalariform, or with simple or bordered pores; a few tracheids; sclerenchyma fibers, long, thin-walled and lignified; a few non-lignified, thick-walled fibers; fragments of epidermal tissue composed of elongated cells with reddish-brown walls; groups of thick-walled parenchyma cells with numerous simple pores.

Cypripedium yields not more than 12 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

DAMIANA

Damiana

Turnera

The leaves of *Turnera diffusa* Willdenow or of *Turnera aphrodisiaca* Ward (Fam. *Turneraceæ*), without the presence of more than 10 per cent. of stems and other parts of the same plants or other foreign matter.

Obovate to lanceolate, from 10 to 25 mm. in length and from 4 to 10 mm. in width, shortly petiolate, obtuse or acute at the apex, and with a short, cuneate base; sharply two- to ten-toothed on each side; the veins ascending, generally strong, straight and simple and running to the sinuses of the teeth, but sometimes branched and sending the branches into the teeth; the upper surface smooth and pale green, the lower glabrous or with a few hairs on the ribs (*Turnera aphrodisiaca*) or densely tomentose over the entire surface (*Turnera diffusa*). Intermixed with the leaves are frequently found some reddish twigs, the young tips and buds of which are grayish with appressed pubescence (*Turnera aphrodisiaca*) or white floccose (*Turnera diffusa*), also flower buds, yellowish flowers, and globose pods. Odor aromatic; taste characteristic, aromatic and resinous.

The powdered drug is light yellowish-green and, when examined under the microscope, exhibits numerous rough simple hairs, up to 0.8 mm. in length and 0.03 mm. in width at the base, with a narrow lumen usually distinct at the base only and with heavy, mostly non-lignified walls, often curved near the base so that the major portion of the hair lies nearly parallel to the surface of the stem or leaf; fragments of the epidermis from the stems composed of somewhat rectangular cells up to about 0.07 mm. in length and about one-half as broad, with square or somewhat pointed ends, with few broadly elliptical stomata about 0.03 mm. in length; sub-epidermal cells from the stem resembling those of the epidermis in shape but with lignified walls; tracheæ, spiral, up to 0.02 mm. in width, with bordered pores up to about 0.035 mm. in width; tracheids from stem few; strongly lignified, thick-walled sclerenchyma cells or fibers few; lignified pith-parenchyma with large simple pores; fragments of epidermal cells and mesophyll of leaf; the former with somewhat wavy, vertical walls and associated with stomata up to 0.024 mm. in length; numerous crystals of calcium oxalate in rosette aggregates up to 0.03 mm. in diameter and occasionally in prisms; starch grains few, simple, up to 0.005 mm. in diameter.

Damiana yields not more than 10 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

DELPHINIUM

Larkspur Seed

Delphin.

The dried seeds of *Delphinium Consolida* Linné or of *Delphinium Ajacis* Linné (Fam. *Ranunculaceæ*), without the presence of more than 5 per cent. of foreign matter.

Irregularly tetrahedral, or by pressure somewhat triangulate, acute at one end, obtuse or rounded at the other, about 2 mm. in length and equally broad or slightly narrower, surface black or blackish-brown, deeply and narrowly furrowed, the furrows intersecting so as to give a sharply tuberculate appearance to the surface, with serrate edges; testa crustaceous; kernel whitish, fleshy; embryo small, in fleshy endosperm. Odor very faint; taste bitter, afterward biting and acrid.

Larkspur Seed yields not more than 7 per cent. of ash.

DEXTRINUM ALBUM

White Dextrin

Dext. Alb.

A mixture of soluble carbohydrates, amylodextrin, achroodextrin, erythrodextrin and maltodextrin, together with a variable amount of unconverted starch, obtained by the incomplete hydrolysis of starch by the action of an acid.

White Dextrin occurs as a white, glistening, non-hygroscopic, amorphous powder producing a peculiar and characteristically harsh sensation when rubbed in the hand; odorless and having a sweetish taste.

Only partly soluble in cold water, but completely soluble in three parts of water on boiling. An aqueous solution prepared in the cold and filtered is colored wine-red by iodine T.S.; an aqueous solution prepared with boiling water is colored blue by iodine T.S.

Alkaline cupric tartrate V.S. is not changed by a solution of White Dextrin in the cold, but is reduced on boiling.

Separate portions of a freshly prepared, filtered solution in cold water do not become turbid on the addition of calcium chloride T.S. or of calcium hydroxide T.S. (*oxalic acid*).

Not more than 5 per cent. of White Dextrin is soluble in boiling alcohol (*dextrose*). Dry White Dextrin at 110° C.; it loses not more than 10 per cent. in weight (*moisture*).

Separate portions of a filtered aqueous solution of White Dextrin (1 in 20) are not immediately precipitated by lead acetate T.S., or by basic lead acetate T.S., but upon the addition of a few drops of ammonia water to the mixtures, precipitation occurs (difference from *natural gums*).

A solution of White Dextrin does not darken on the addition of hydrogen sulphide T.S. even when supersaturated with ammonia water (*metals*).

White Dextrin yields not more than 0.5 per cent. of ash.

DIOSCOREA

Dioscorea

Diosc. Wild Yam Root

The dried rhizome of *Dioscorea villosa* Linné (Fam. *Dioscoreaceæ*).

Knotted and woody, elongated, from 6 to 12 mm. in thickness, often compressed, bent and branched, bearing scattered nodular projections at the sides, slender tough roots underneath and stem-scars on the upper surface; externally pale brown, surface more or less scaly from the partly detached, thin outer layer; fracture short but tough, the fractured surface whitish or pale-brown, with numerous small, scattered, yellowish wood bundles. Odorless; taste starchy, insipid, afterwards acrid.

Dioscorea yields not more than 7 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

DROSERA

Drosera

Droser. Sundew

The air-dried flowering plant of *Drosera rotundifolia* Linné (Fam. *Droseraceæ*), frequently mixed with the closely allied species *Drosera intermedia* Hayne and *Drosera longifolia* Linné, or at times wholly replaced by these.

A delicate plant of a reddish color throughout, with few fibrous, blackish rootlets; leaves all in a basal rosette, blade orbicular, about 15 mm. in diameter, abruptly contracted into a slender, pubescent petiole, upper surface covered with prominent glandular hairs; scape filiform, smooth, from 10 to 20 cm. in length, bearing a few, five-parted, small, white fugacious flowers in a curved, one-sided raceme.

Drosera intermedia is identified by its spatulate leaves with blades two or three times as long as they are wide and glabrous petioles. *Drosera longifolia* is identified by its elongated spatulate obovate leaves with blades six to eight times as long as they are wide, and its slender smooth petioles and scape, declinate at base. Odorless; taste faintly bitter and acidulous.

Drosera yields not more than 30 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

DULCAMARA

Bittersweet

Dulcam.

The dried stems and branches of *Solanum Dulcamara* Linné (Fam. *Solanaceæ*).

In short sections about 5 mm. or less in thickness, cylindraceous, somewhat angular, longitudinally striate, more or less warty, usually hollow in the center; bark thin, externally pale greenish, or light greenish-brown, glabrous, marked with alternate leaf scars, internally green, the greenish or yellowish wood occurring in one or two concentric rings. Odor slight; taste bitter, afterwards sweet.

The powder is greenish-yellow and, when examined under the microscope, exhibits tracheæ up to 0.05 mm. in diameter and with bordered pores; lignified wood fibers with few pores; non-lignified bast fibers with walls up to 0.02 mm. in thickness; fragments of cork cells; few, simple, unicellular hairs up to 0.8 mm. in length, and with the lumina distinct in the lower portions only; few starch grains, spheroidal, up to 0.012 mm. in diameter; sphenoidal crystals of calcium oxalate numerous, up to 0.007 mm. in length.

Bittersweet yields not more than 6 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

ECHINACEA

Echinacea

Echin.

The dried rhizome and roots of *Brauneria pallida* (Nuttall) Britton (*Echinacea angustifolia* De Candolle) (Fam. *Compositæ*).

Nearly entire, cylindrical, very slightly tapering and sometimes slightly spirally twisted, from 10 to 20 cm. in length and from 4 to 13 mm. in diameter, externally grayish-brown, light brown or purplish-brown, slightly annulate in the upper portion, with occasional V-shaped stem scars, somewhat longitudinally wrinkled, or furrowed; fracture short, fibrous, bark less than 1 mm. in thickness, wood thick and composed of alternate light yellowish and black wedges; the rhizome with a circular pith. Odor faint, aromatic; taste sweetish, followed by a tingling sensation suggesting aconite, but lacking the persistent and benumbing effect produced by that drug.

Under the microscope, sections show the presence of intercellular (schizogenous) oil and resin cavities or reservoirs in both the wood and bark, numerous stone cells distinguished by the presence of a blackish, resinous substance in the intercellular spaces between them and some of the adjoining parenchyma, the latter containing masses or aggregates of inulin. The walls of the tracheæ or vessels are marked with simple slit-like pores or annular and reticulate thickenings; bast fibers occur in the stem, and in some specimens true libriform or wood fibers are found.

Echinacea yields not more than 6 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

EUONYMUS

Euonymus

(U.S.P. VIII)

Euonym. Wahoo Bark

The dried bark of the root of *Euonymus atropurpureus* Jacquin (Fam. *Celastraceæ*), without the presence of more than 3 per cent. of wood or other foreign matter.

Usually in transversely curved pieces, occasionally in single quills from 2 to 7 cm. in length; bark from 1 to 2.5 mm. in thickness; very light in weight; outer surface grayish or light brown, somewhat wrinkled, occasionally transversely fissured from the lenticels and with scale-patches of soft cork; inner surface grayish white, longitudinally striate and somewhat porous; fracture short with silky, projecting elastic fibers. Odor distinct; taste bitter and acrid.

The powder is light brown, and when examined under the microscope shows numerous starch grains, nearly spherical, from 0.003 to 0.012 mm. in diameter; fragments of cork with nearly colorless, thin walls; secretion cells with yellowish

or brownish amorphous contents; bast fibers very long, with thin, non-lignified walls possessing numerous small, more or less oblique pores; numerous fragments of starch-bearing parenchyma; calcium oxalate in rosette aggregates from 0.015 to 0.035 mm. in diameter, the amount in different specimens showing some variation.

Euonymus yields not more than 12 per cent. of ash.

AVERAGE DOSE—Metric, 0.5 Gm.—Apothecaries, 8 grains.

CAUTION—It has been stated that the absorption of Euonymus in the gastro-intestinal tract is uncertain and irregular. To avoid an accumulation of the drug or toxic action, the physician should carefully guard the dosage and determine in each case the tolerance of the patient.

EUPATORIUM

Eupatorium

(U.S.P. VIII)

Eupator. Thoroughwort Boneset

The dried leaves and flowering tops of *Eupatorium perfoliatum* Linné (Fam. *Compositæ*).

Usually more or less broken; leaves opposite, the pair united at the base, from 8 to 20 cm. in length and from 1.5 to 5 cm. in breadth, tapering regularly from near the base to an acute summit, crenate-serrate, rugosely veined, rough and bright green above, yellowish-gray-green, tomentose and resinous-dotted beneath; flower-heads small, numerous, corymbed, with a campanulate involucre of lance-linear, imbricated scales and with from ten to fifteen tubular, yellowish-white florets having a bristly pappus in a single row. Odor faintly aromatic; taste strongly bitter.

Eupatorium yields not more than 10 per cent of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

EUPHORBIA PILULIFERA

Euphorbia Pilulifera

Euphorb. Pilul. Pill Bearing Spurge

The dried herb of *Euphorbia pilulifera* Linné (Fam. *Euphorbiaceæ*), collected while flowering and fruiting.

Roots usually present, small, branched, and reddish; stems slender, cylindrical, obliquely erect, dichotomously branched from near the base, branches recurved at apices; branches and stem only sparsely leafed at base, pale greenish-brown, rough or hairy; stems coarsely pilose with yellow hairs which are rather dense on the upper parts but sparse on the lower; pubescence consisting of short, nearly straight, unicellular hairs, becoming almost hispid at the flowering tops; leaves opposite, obliquely oblong, acute, serrulate, rusty pale green, pubescent especially on the prominent veins on the lower surface, becoming brittle on drying and usually much broken in the drug; flowers small, numerous, in short peduncled axillary clusters; fruits about 1 mm. in diameter, three-celled capsules; seeds about 0.9 mm. in diameter, triangular ovoid, pale brown. Odor aromatic and characteristic; taste faintly bitter, aromatic and acrid.

Euphorbia Pilulifera yields not more than 12 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

EXTRACTUM CARNIS

Extract of Beef

Ext. Carnis Beef Extract

The residue obtained from fresh beef broth by evaporation at a low temperature.

A yellowish-brown to dark-brown, slightly acid, pasty mass having an agreeable meat-like odor and taste.

Twenty-five Gm. of Extract of Beef, diluted to 250 mils with distilled water, yields a nearly clear solution, free from sediment. Separate portions of this solution respond to the following tests:

Boil 10 mils of the solution for one minute with 1.5 Gm. of purified animal charcoal, add distilled water to replace that lost by evaporation and filter; the filtrate produces no blue coloration when one drop is added to three drops of a solution of diphenylamine (1 in 100) in concentrated sulphuric acid (*nitrate*).

Distribute 10 mils of the solution over dry sand or asbestos and dry to constant weight in a flat-bottomed porcelain dish in an oven at a temperature of 105° C.; it yields a residue of not less than 0.75 Gm., equivalent to 75 per cent. of solids in the original Extract.

Incinerate the residue from 10 mils of the solution obtained in the preceding test; the ash does not exceed 30 per cent. of the residue, nor does the sodium chloride in the ash exceed 10 per cent. of the residue when determined as directed under the Assay for chlorides (see page 358).

To 100 mils of the solution contained in a 500 mil Kjeldahl flask, add 5 Gm. of barium carbonate and 100 mils of distilled water and, using a connecting bulb, distil 100 mils into 10 mils of half-normal hydrochloric acid V.S. Titrate the excess of acid, using cochineal T.S. as indicator, and from the acid consumed by the distillate, calculate the percentage of nitrogen as ammonia. This does not exceed 0.35 per cent. of the total solids.

Transfer 25 mils of the solution to a 100 mil Erlenmeyer flask, add 50 mils of alcohol and shake the mixture thoroughly. When the precipitate has subsided, filter, collect the precipitate upon a 9 cm., counterpoised filter, wash the precipitate three times with a mixture of two volumes of alcohol and one volume of distilled water and then dry it to constant weight at 105° C. The weight of this precipitate does not exceed 10 per cent. of the total solids. (Reserve the filtrate and washing for the following determination of nitrogen.)

To an aliquot portion of the alcoholic filtrate from the preceding test corresponding to 1 Gm. of the alcohol soluble solids, add 4 mils of sulphuric acid and evaporate to dryness in a 500 mil Kjeldahl flask. Determine the nitrogen by the Gunning-Kjeldahl method. The amount of nitrogen thus found is not less than 0.06 Gm.

FARFARA

Coltsfoot

Farfar. Coltsfoot Leaves Tussilago Leaves

The dried leaves of *Tussilago Farfara* Linné (Fam. *Compositæ*), without the presence of more than 5 per cent. of other parts of the plant or other foreign matter.

Petioles long, pubescent; blades very brittle, nearly orbicular or broadly ovate-reniform, from 8 to 15 cm. in length and nearly as broad, deeply cordate at the base, angulately lobed and dentate with red-brown teeth, palmately five- to nine-veined;

young leaves white floccose all over, the older leaves with upper surfaces dark green and nearly smooth, the younger densely white floccose. Odor indistinct; taste mucilaginous, faintly herbaceous, bitter.

The powder, when examined under the microscope, exhibits numerous multicellular, non-branching hairs, usually curved and twisted together, the lower cells about 0.035 mm. in width, the terminal cells much elongated, about 0.012 mm. in width and at times with spiral bands; broadly elliptical stomata about 0.05 mm. in length and associated with finely striated epidermal cells, the latter having wavy vertical walls; non-porous sclerenchymatous fibers few with walls from 0.006 to 0.01 mm. in thickness; parenchyma cells containing chloroplastids; tracheæ few, spiral, annular or with simple pores.

Coltsfoot yields not more than 20 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

FERRI GLYCEROPHOSPHAS

Ferric Glycerophosphate

Ferr. Glycerophos. Ferric Glycerinophosphate

It contains a variable quantity of $Fe_2(C_3H_7O_6P)_3$ (621.97) corresponding to not less than 14 per cent. nor more than 16 per cent. of Fe. Preserve it in well-closed containers, protected from light.

Ferric Glycerophosphate occurs as yellowish-green, transparent, amorphous scales or as a greenish-yellow powder; odorless and nearly tasteless.

One gramme dissolves slowly in about 2 mils of water at 25° C.; insoluble in alcohol. An aqueous solution is acid to litmus and becomes turbid when heated.

An aqueous solution of the salt (1 in 20) is colored dark blue by potassium ferrocyanide T.S.; on the subsequent addition of hydrochloric acid a dark blue precipitate is produced.

Heat a powdered mixture of about 0.1 Gm. of the salt with about 0.5 Gm. of potassium bisulphate; the pungent vapors of acrolein are evolved.

Incinerate 0.5 Gm. of the salt; it yields a red-brown residue, which is not alkaline to moistened litmus paper.

Not more than a slight yellow turbidity is produced at once on mixing 5 mils of an aqueous solution of the salt (1 in 50) with 10 mils of ammonium molybdate T.S. (*phosphate*), but on standing or on warming, a yellow precipitate is formed.

An aqueous solution of the salt (1 in 50), acidulated with hydrochloric acid, does not become more than slightly turbid on the addition of barium chloride T.S. (*sulphate*).

Another portion of this aqueous solution, acidulated with nitric acid, does not become more than slightly turbid on the addition of silver nitrate T.S. (*chloride*).

Assay.—Dissolve about 0.5 Gm. of Ferric Glycerophosphate, accurately weighed, in 50 mils of distilled water, in a 100 mil glass-stoppered flask, add 5 mils of hydrochloric acid and about 3 Gm. of potassium iodide. Warm to 40° C., and allow the mixture to stand one-half hour at this temperature, in the stoppered flask, cool, and then titrate the liberated iodine with tenth-normal sodium thiosulphate V.S., using starch T.S. as indicator. It shows not less than 14 per cent. nor more than 16 per cent. of Fe.

Each mil of tenth-normal sodium thiosulphate V.S. used corresponds to 0.005584 Gm. of Fe. Each gramme of Ferric Glycerophosphate corresponds to not less than 25.07 mils nor more than 28.65 mils of tenth-normal sodium thiosulphate V.S.

AVERAGE DOSE—Metric, 0.2 Gm.—Apothecaries, 3 grains.

FERRI HYPOPHOSPHIS

Ferric Hypophosphite

(U.S.P. VIII)

Ferr. Hypophos.

It contains not less than 98 per cent. of $Fe(PH_2O_2)_3$ (251.01) corresponding to not less than 21.8 per cent. of Fe. Preserve it in well-closed containers.

Ferric Hypophosphite occurs as a white, or grayish-white powder, odorless and nearly tasteless; permanent in the air.

One gramme dissolves in 2300 mils of water at 25° C. and in 1200 mils of boiling water; more readily soluble in the presence of hypophosphorous acid or in a warm, concentrated solution of an alkali citrate, forming with the latter a green solution.

When strongly heated in a dry test tube, the salt evolves spontaneously inflammable hydrogen phosphide gas, and finally leaves a residue of ferric pyrophosphate.

Ferric Hypophosphite is readily oxidized by nitric acid or other oxidizing agents.

Add 15 mils of acetic acid to 1 Gm. of the salt; no effervescence occurs (*carbonate*). Heat this mixture to boiling and filter; the filtrate responds to the following tests:

Add to a portion of the filtrate a few drops of silver nitrate T.S. and warm; a brown to black coloration or precipitate is produced. To another portion of the filtrate add, drop by drop, an excess of mercuric chloride T.S.; a white precipitate of mercurous chloride is formed upon gently heating.

Another 5 mil portion of the filtrate shows no turbidity with ammonium oxalate T.S. (*calcium*).

Dissolve 1 Gm. of the salt in 20 mils of diluted hydrochloric acid, with the aid of heat, and add 1 mil of barium chloride T.S.; not more than a slight turbidity is produced (*sulphate*).

Boil 0.5 Gm. of the salt with 10 mils of sodium hydroxide T.S.; a reddish-brown precipitate is produced. Filter this mixture, slightly acidulate the filtrate with hydrochloric acid, add magnesia mixture T.S. and then an excess of ammonia water; no crystalline precipitate is produced (*phosphate*).

Dissolve 1 Gm. of the salt in about 25 mils of boiling distilled water by the aid of sufficient hydrochloric acid, added drop by drop, then add 2 mils of nitric acid, boil and add a slight excess of ammonia water; the filtrate is colorless, and, after acidulating with hydrochloric acid, does not respond to the Test for heavy metals (see page 357).

Assay.—To 1 Gm. of Ferric Hypophosphite accurately weighed, add 10 mils of nitrohydrochloric acid and evaporate to dryness on a water bath. Dissolve the residue in 25 mils of distilled water and 10 mils of hydrochloric acid, transfer the solution to a glass-stoppered flask, add 3 Gm. of potassium iodide, keep it at 40° C. for thirty minutes, cool and titrate the liberated iodine with tenth-normal sodium thiosulphate V.S., using starch T.S. as indicator. It shows not less than 21.8 per cent. of Fe.

Each mil of tenth-normal sodium thiosulphate V.S. used corresponds to 0.005584 Gm. of Fe, and 0.025101 Gm. of $Fe(PH_2O_2)_3$. Each gramme of Ferric Hypophosphite requires not less than 39.04 mils of tenth-normal sodium thiosulphate V.S.

AVERAGE DOSE—Metric, 0.2 Gm.—Apothecaries, 3 grains.

FERRI LACTAS

Ferrous Lactate

Ferr. Lact. Iron Lactate

It contains not less than 97 per cent. of $Fe(C_3H_5O_3)_2 + 3H_2O$ (287.98). Preserve it in well-closed containers.

Ferrous Lactate occurs as a greenish-white crystalline powder, or in crystalline masses, having a slight, characteristic odor and a mild, sweet, and ferruginous taste.

One gramme dissolves slowly but almost completely in 40 mils of water at 25° C., and in 12 mils of boiling water; freely soluble in solutions of the alkali citrates yielding a green-colored solution; almost insoluble in alcohol.

When strongly heated, the salt froths, gives out dense, white, acrid fumes, then chars and finally leaves a brownish-red residue.

An aqueous solution of the salt is greenish-yellow, slightly acid to litmus, and separate portions give a deep blue precipitate with potassium ferricyanide T.S., and a light blue precipitate with potassium ferrocyanide T.S.

Separate portions of an aqueous solution of the salt (1 in 20), acidulated with nitric acid, do not give more than a slight opalescence with barium chloride T.S. (*sulphate*), or with silver nitrate T.S. (*chloride*).

Mix 25 mils of an aqueous solution of the salt (1 in 50) with 5 mils of diluted sulphuric acid, boil the mixture for a few minutes, then precipitate the iron by an excess of potassium or sodium hydroxide T.S., and filter; the filtrate, mixed with a few drops of alkaline cupric tartrate V.S. and heated to boiling, does not give a red precipitate (*sugar*).

A portion of the salt triturated with sulphuric acid does not develop an offensive odor (*butyric acid*), nor is any gas evolved (*carbonate*); this mixture, after standing for five minutes, does not assume a brown color (*readily carbonizable impurities*).

Ignite 1 Gm. of the salt; the residue is not alkaline to moistened litmus paper, and does not contain anything soluble in water.

Assay.—Dissolve in a flask about 0.5 Gm. of Ferrous Lactate, accurately weighed, in 15 mils of solution of hydrogen dioxide and evaporate this solution on a water bath to 5 mils. Add 5 mils of sulphuric acid, boil the mixture for two minutes, cool to 40° C. and add 25 mils of distilled water and 0.5 Gm. of potassium iodide. Allow this mixture to stand for one-half hour at 40° C., cool, and then titrate the liberated iodine with tenth-normal sodium thiosulphate V.S., using starch T.S. as indicator. It shows not less than 97 per cent. of $Fe(C_3H_5O_3)_2 + 3H_2O$.

Each mil of tenth-normal sodium thiosulphate V.S. corresponds to 0.0288 Gm. of $Fe(C_3H_5O_3)_2 + 3H_2O$. Each gramme of Ferrous Lactate requires not less than 33.7 mils of tenth-normal sodium thiosulphate V.S.

AVERAGE DOSE—Metric, 0.3 Gm.—Apothecaries, 5 grains.

FERRI PYROPHOSPHAS

Ferric Pyrophosphate

(U.S.P. VIII)

Ferr. Pyrophos. Soluble Ferric Pyrophosphate

It contains Ferric Pyrophosphate corresponding to not less than 10 per cent. of Fe. Preserve it in well-closed containers, protected from light.

Ferric Pyrophosphate occurs in thin, apple-green, transparent scales, without odor, and having an acidulous, slightly saline taste. The salt is permanent in dry air, when protected from light, but when unprotected soon becomes discolored.

It is freely and completely soluble in water; insoluble in alcohol. An aqueous solution of the salt is slightly acid to litmus.

Ferric Pyrophosphate, when boiled with sodium hydroxide T.S., produces a brownish-red precipitate without evolving ammonia.

Fuse 0.1 Gm. of the salt with 0.1 Gm. each of potassium nitrate and sodium carbonate, boil the residue with 10 mils of distilled water and filter. The filtrate, after being rendered nearly, but not quite, neutral with highly dilute nitric acid, yields a yellow precipitate on the addition of silver nitrate T.S.

Boil an aqueous solution of the salt (1 in 10) with an excess of sodium hydroxide T.S. until the iron is precipitated, filter, strongly acidulate the filtrate with hydrochloric acid and cool a portion of the liquid. This liquid, when mixed with an equal volume of magnesia mixture T.S., followed by a slight excess of ammonia water, yields a finely divided white precipitate, which, after collecting on a filter and washing, does not turn yellow when treated with a few drops of silver nitrate T.S. (*phosphate*).

Assay.—Dissolve about 1 Gm. of Ferric Pyrophosphate, accurately weighed, in 25 mils of distilled water and 15 mils of hydrochloric acid, in a glass-stoppered bottle, add 2 Gm. of potassium iodide, securely stopper the bottle, keep it at a temperature of 40° C. for thirty minutes, cool and then titrate the liberated iodine with tenth-normal sodium thiosulphate V.S., using starch T.S. as indicator. It shows not less than 10 per cent. of Fe.

Each mil of tenth-normal sodium thiosulphate V.S. used corresponds to 0.005584 Gm. of Fe. Each gramme of Ferric Pyrophosphate corresponds to not less than 17.9 mils of tenth-normal sodium thiosulphate V.S.

AVERAGE DOSE—Metric, 0.25 Gm.—Apothecaries, 4 grains.

FICUS

Fig

(U.S.P. VIII)

The partially dried fruit of *Ficus Carica* Linné (Fam. *Moraceæ*).

Usually compressed, of irregular rounded shapes, from 2.5 to 5 cm. in diameter, fleshy, light brown to yellow, frequently with an efflorescence of sugar; summit with a small, scaly orifice; base with a scar or short stalk; internally hollow, with numerous small, brownish-yellow, glossy, and hard akenes. Odor distinctive, fruity; taste sweet, pleasant.

FRAXINUS

White Ash Bark

Fraxin.

The dried bark of *Fraxinus americana* Linné (Fam. *Oleaceæ*) and probably of other species of *Fraxinus*, deprived of the corky layer.

In flat pieces of varying length and width, from 3 to 6 mm. in thickness, externally yellowish or pale brown, sometimes with ridges of a warty nature and fissures of a grayish-brown color with markings of lichens; inner surface, pale brown to yellowish, longitudinally striate; fracture very uneven, fibrous. Odor faintly aromatic; taste bitter, weakly acrid.

Fraxinus yields not more than 10 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

FUCUS

Fucus

Bladderwrack

The dried thallus of *Fucus vesiculosus* Linné (Fam *Fucaceæ*).

Sometimes a meter in length, but usually in shorter pieces, from 1 to 4 cm. in width, dichotomously branched, brownish black, usually with a slight, whitish incrustation; flat, smooth, entire-margined, having a stout midrib throughout, along which are irregularly disposed pairs of air-vesicles which vary in diameter from 5 to 15 mm.; receptacles terminal, compressed, mostly ovate or elliptical and about 1 cm. in length, but varying from spherical and 5 mm. in diameter to linear-lanceolate and 5 cm. in length, forked, solitary, or in pairs. Odor strongly seaweed-like; taste saline and nauseous.

Fucus yields not more than 20 per cent. of ash.

AVERAGE DOSE—Metric, 0.65 Gm.—Apothecaries, 10 grains.

GALANGA

Galanga

Galang.

The dried rhizome of *Alpinia officinarum* Hance (Fam. *Zingiberaceæ*).

Irregularly branched, from 2 to 10 cm. in length and from 1 to 2 cm. in thickness, the branches thinner toward the base; marked with the fine annuli of the leaf bases, which are from 3 to 10 mm. apart and of lighter color than the general surface; externally reddish- or rusty-brown; internally of a lighter orange-brown; cut ends of the branches circular, with recurved margin; fracture fibrous. Odor aromatic and agreeable; taste hot, spicy, resembling ginger.

The powder is reddish-brown and, when examined under the microscope, exhibits numerous simple starch grains up to 0.06 mm. in diameter, the small grains few in number, the large grains narrow-ellipsoidal, broadened at one end, sometimes truncate, frequently curved, occasionally with a lateral development, lamellæ mostly indistinct, point of origin of growth circular or a cleft in the larger end of the grain, sometimes absent; numerous yellowish oil cells and reddish resin cells; fragments of tracheæ with reticulate thickenings or simple pores; thick-walled sclerenchymatous fibers with oblique pores.

Galangal yields not more than 10 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

GALEGA

Galega

Galeg. European Goat's Rue

The dried flowering tops of *Galega officinalis* Linné (Fam. *Leguminosæ*).

Stem smooth, erect, branched, when entire from 15 to 45 cm. in length, commonly cut and broken; leaves oddly-pinnate with from six to eight pairs of leaflets; stipules lanceolate, sagittate on one side; leaflets bright green, smooth or slightly hairy, short petioled, lanceolate or ovate-lanceolate, obtuse, slightly mucronate, from 2 to 5 cm. in length and from 2 to 6 mm. in breadth; flowers small, white to violet, in axillary racemes. Odor indistinct, taste mucilaginous, slightly bitter and astringent; it colors the saliva yellowish-green.

Galega yields not more than 12 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

GERANIUM

Geranium

(U.S.P. VIII)

Geran. Cranesbill

The dried rhizome of *Geranium maculatum* Linné (Fam. *Geraniaceæ*).

Rhizome cylindraceous, somewhat branched, bent, flattened and strongly tuberculated, from 2.5 to 10 cm. in length and from 3 to 15 mm. in diameter; surface marked with root scars and remnants of slender roots, longitudinally wrinkled; externally dark purple-brown; internally light purple-brown; fracture short, non-fibrous, the section shows a thin bark, a distinct cambium, irregular in outline, large central pith, wood indistinct, the fibro-vascular bundles few and at unequal distances. Odorless; taste strongly astringent.

The powder is purplish-brown and, when examined under the microscope, exhibits tangentially elongated cork cells; parenchyma containing starch, scattered cells of pith and bark parenchyma containing tannin both in the content and walls of the cells and colored bluish-black by ammonio-ferric alum T.S.; tracheæ small, with scalariform markings; characteristic starch more or less abundant, grains smooth, mostly single, ovate, up to 0.035 mm. in length, hilum near the larger end, inner lamellæ concentric with hilum, the outer excentric.

Geranium yields not more than 8 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

GOSSYPII CORTEX

Cotton Root Bark

(U.S.P. VIII)

Gossyp. Cort.

The recently-gathered air-dried bark of the root of one or more of the cultivated varieties of *Gossypium herbaceum* Linné, *Gossypium Barbadense* Linné, or *Gossypium arboreum* Linné (Fam. *Malvaceæ*), without the presence of more than 5 per cent. of wood or other foreign matter.

In flexible bands or quilled pieces, attaining a length of 30 cm. and a thickness of about 1 mm.; outer surface orange-brown, smooth, slightly wrinkled, with small circular lenticels, the outer corky layer frequently exfoliated and showing the more or less fissured and fibrous middle bark; inner surface light brown, longitudinally striate; fracture tough, fibrous, the inner bark readily separable into fibrous layers. Odor slight; taste very slightly acrid.

Under the microscope, sections of Cotton Root Bark show an outer layer of cork composed of four to six layers of tabular, thin-walled, yellowish-brown, non-lignified cells; a thin primary cortex, consisting of starch-bearing parenchyma and an occasional large secretion reservoir with yellowish-brown contents; inner bark with large groups of bast fibers arranged in interrupted, concentric circles, separated radially by medullary rays and tangentially by the leptome or sieve tissue; bast fibers from 0.3 to 1 mm. in length and about 0.015 mm. in width, the walls being about 0.005 mm. in thickness, strongly lignified and with very few pores, the ends being acute and markedly attenuate; medullary rays one to six cells wide, the cells usually filled with starch grains; the latter from 0.003 to 0.02 mm. in diameter; occasional cells containing rosette aggregates of calcium oxalate from 0.009 to 0.025 mm. in diameter.

Cotton Root Bark yields not more than 7 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

GUAIACI LIGNUM

Guaiac Wood

Guaiac. Lig. Lignum Vitæ

The heart-wood of *Guaiacum officinale* Linné or of *Guaiacum sanctum* Linné (Fam. *Zygophyllaceæ*).

Usually in the form of shavings, chips or raspings of a greenish-brown color, heavier than water, entirely free from adhering bark and containing only a few chips or shavings of a whitish color (*sap wood*). Almost odorless except when heated; taste bitter and acrid when chewed for some time.

The powder, when examined under the microscope, exhibits numerous fragments of more or less lignified, thick-walled wood fibers, up to 0.028 mm. in width, some with simple, oblique pores; tracheæ from 0.09 to 0.16 mm. in width, some filled with resin; numerous small masses of resin; wood parenchyma and medullary ray cells up to 0.02 mm. in width, with lignified, porous walls and usually containing resin; occasionally tangential views of the medullary rays show an elliptical group of from three to six cells; the resin masses and resinous tissue become bluish-green on the addition of iodine T.S.

Place powdered Guaiac Wood in a solution of sodium chloride (1 in 3); the blackish-brown part only will sink and this does not exceed in amount the portion which floats.

Shake 10 mils of alcohol with 0.5 Gm. of ground Guaiac Wood for a few seconds and filter the mixture; the filtrate yields a deep blue color with one drop of a solution of ferric chloride (1 in 10).

Guaiac Wood yields to alcohol not less than 15 per cent. of extractive.

Guaiac Wood yields not more than 3 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

GUTTA PERCHA

Gutta Percha

The purified, coagulated, milky exudate of various trees of the genus *Palaquium* Blanco (Fam. *Sapotaceæ*).

In masses, sticks or sheets of irregular size and shape, tough, yellowish-white in color and usually with reddish, marbling streaks.

Insoluble in water; partly soluble in chloroform, carbon disulphide, petroleum benzin, or oil of turpentine, leaving not more than 10 per cent. of undissolved residue.

Slightly elastic at ordinary temperatures, becoming pliable at from 25° to 30° C. It gradually softens on further heating, becoming quite plastic at 60° C.

One Gm. of Gutta Percha when boiled for one hour with 20 mils of dehydrated alcohol in a flask, connected with a reflux condenser, leaves not less than 0.5 Gm. of undissolved residue.

When exposed to air and sunlight, Gutta Percha absorbs oxygen and becomes brittle.

Gutta Percha yields not more than 5 per cent. of ash.

HÆMATOXYLON

Hematoxylon

(U.S.P. VIII)

Hæmatox. Logwood

The heart-wood of *Hæmatoxylon campechianum* Linné (Fam. *Leguminosæ*) that has not undergone fermentation.

Usually in small chips, reddish-brown, the freshly cut surface dark yellowish-red; a transverse section of the wood shows medullary rays which are up to four cells wide. Odor faint, agreeable; taste sweetish, astringent.

Hematoxylon imparts a yellowish color to water containing a little acid, the color being changed to purple or violet-red by alkalies.

The powder is reddish-brown and, when examined under the microscope, exhibits medullary ray cells in one to seven rows; wood fibers, long, with thickened walls; wood parenchyma with occasional crystals of calcium oxalate; tracheæ from 0.09 to 0.17 mm. in width; walls of the cells colored brownish-red, the inner cells containing resin masses.

Hematoxylon yields not more than 3.5 per cent. of ash.

HAMAMELIDIS FOLIA

Hamamelis Leaves

(U.S.P. VIII)

Hamamel. Fol. Witch Hazel Leaves

The dried leaves of *Hamamelis virginiana* Linné (Fam. *Hamamelidaceæ*), collected in autumn before the flowering of the plants, and without the presence of more than 10 per cent. of stems or other foreign matter.

Petioles from 1 to 1.5 cm. in length; laminæ when entire broadly elliptical or rhomboid-ovate, usually inequilateral, mostly from 8 to 12 cm. in length; summits usually acute, sometimes rounded or acuminate; bases slightly heart-shaped and oblique; margins sinuate or sinuate-dentate; upper surfaces pale or brownish-green, occasionally dark brown with a few stiff, straight hairs: lower surfaces lighter in color, somewhat hairy, midrib and veins prominent. Odor slight; taste astringent, slightly aromatic and bitter.

Transverse sections show in addition to the epidermal layers, a palisade layer consisting of a single row of cells and a dorsal pneumatic tissue made up of three to six rows of strongly branching cells; large collateral, fibro-vascular bundles occur in the midrib and petiole, the tracheæ narrow, mostly spiral and associated with numerous narrow, strongly lignified and porous wood fibers; around the phloem occurs a nearly continuous circle of bast fibers, possessing strongly lignified walls; calcium oxalate in monoclinic prisms, from 0.01 to 0.035 mm. in diameter, either in the cells of the mesophyll or in crystal fibers associated with the bast fibers.

Under the microscope, surface sections of Hamamelis Leaves show upon the lower surface narrow elliptical stomata, about 0.015 mm. in length and with two to four neighboring cells; from both surfaces, but especially from the under surface, arise stellate hairs composed of from four to twelve cells united at the base, the individual cells being from 0.02 to 0.075 mm. in length, either straight or more or less bent and with very thick walls and narrow lumina, the latter sometimes only apparent in the lower portion of the cells.

Hamamelis Leaves yield not more than 6 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

HELIANTHEMUM

Helianthemum

Helianth. Rock-rose Frost-weed

The dried herb of *Helianthemum canadense* (Linné) Michaux (Fam. *Cistaceæ*).

Stems mostly less than 5 cm. in length, branched above, terete, frequently reddish, canescent, the slender branches mostly erect; leaves very short-petioled, from 1 to 3 cm. in length, and from 4 to 8 mm. in width, oblong to oblanceolate, with entire, revolute margins, green and somewhat rough on the upper surface, canescent underneath; flowers of two kinds, rarely present at the same time, the early ones mostly solitary, pedicelled, with bright yellow corolla, from 2 to 3 cm. in breadth, hairy calyx, about thirty stamens and a single three-carpelled pistil, producing an ovoid capsule, about 7 mm. in length; later flowers apetalous, clustered in the leaf-axils, nearly sessile, having but four stamens and producing a capsule about 4 mm. in length. Odor slightly aromatic; taste astringent and bitter.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

HELONIAS

Helonias

Helon. False Unicorn

The dried rhizome and roots of *Chamælirium luteum* (Linné) A. Gray (Fam. *Liliaceæ*).

Rhizome upright, or oblique, nearly cylindrical, from 0.5 to 3 cm. in length and about 1 cm. in diameter; externally grayish-brown, annulate from scars of bud-scales; upper portion with leaf bases enclosing a small bud; oblique rhizomes with a few stem scars about 0.5 mm. in diameter; lower portion with numerous whitish or pale yellowish, nearly straight or slightly curved wiry roots, from 5 to 8 cm. in length; fracture hard and horny; internally grayish-yellow, cortex from 3 to 4 mm. in thickness, central cylinder with three or four circles of small, nearly circular fibro-vascular bundles. Odor distinctive; taste bitter, slightly astringent.

Sections of the rhizome, when examined under the microscope, show parenchyma cells with numerous spherical or ellipsoidal starch grains, varying from 0.002 to 0.015 mm. in diameter; numerous raphides varying from 0.025 to 0.035 mm. in length; the fibro-vascular bundles vary from 0.2 to 0.3 mm. in diameter, the tracheæ being at the periphery and the walls marked either with annular or reticulate thickenings or simple pores. In the root the cortex is always attached and there are usually six mestome strands.

Helonias yields not more than 5 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

HYDRANGEA

Hydrangea

Hydrang. Seven-barks

The dried rhizome and roots of *Hydrangea arborescens* Linné (Fam. *Saxifragaceæ*).

Rhizome cylindrical, usually cut into pieces from 3 to 10 cm. in length and from 3 to 20 mm. in diameter; externally light brown to yellowish-brown with a pinkish tinge, longitudinally wrinkled, marked by few elliptical lenticels and occasional prominent buds, short branches or stem scars; from the lower surface arise a few coarse fibrous

roots; fracture tough, splintery; internally yellowish-white or light brown, bark thin, easily separable from the distinctly radiate wood which surrounds a prominent whitish pith. Roots attaining a length of 25 cm. and a thickness of 2 mm., irregularly bent and branching, otherwise resembling the rhizome with the exception of the pith being absent. Inodorous; taste sweetish, becoming slightly acrid.

Under the microscope, sections of the rhizome of Hydrangea show a gray cork of a few rows of tabular cells, a cortex made up chiefly of parenchyma containing starch, large cells containing raphides and small isolated groups of stone cells or sclerenchymatous fibers; a woody cylinder composed of slender wedges made up of prominent tracheæ with reticulate thickenings and tracheids separated by medullary rays one to three cells wide, the cells of which are filled with small starch grains; pith of large polygonal cells with prominent simple pores.

The powder is light yellowish-brown, containing irregular fragments consisting of strongly lignified tracheæ, tracheids and medullary ray cells; stone cells and sclerenchymatous fibers from 0.05 to 0.2 mm. in length, strongly lignified, the walls marked by simple and branching pores; raphides numerous, from 0.07 to 0.13 mm. in length; starch grains mostly single, more or less ellipsoidal, occasionally with a prominent central cleft and varying from 0.002 to 0.01 mm. in diameter.

Hydrangea yields not more than 3 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

IGNATIA

Ignatia

Ignat. Saint Ignatius Bean Ignatia Amara

The dried ripe seeds of *Strychnos Ignatii* Bergius (Fam. *Loganiaceæ*), yielding not less than 2 per cent. of the alkaloids of Ignatia.

Heavy, hard, angularly ovate with obtuse angles, from 20 to 30 mm. in length and about 15 mm. in breadth and thickness; externally grayish or reddish-black, nearly smooth with few or no hairs; fracture granular and translucent in small fragments; a small irregular cavity in the center. Nearly inodorous and intensely bitter.

The powder is grayish-brown and, when examined under the microscope, exhibits thin cells of the epidermis and the subjacent layer of the seed coat, polygonal cells with thickened, pitted walls; hairs characteristic, spreading and thickened at the base and having linear markings; endosperm tissue, the outer cells small, contents granular, the inner larger, with thickened walls; lumen irregular in size and shape.

Ignatia yields not more than 4 per cent. of ash.

Assay.—Introduce 15 Gm. of Ignatia, in No. 40 powder, into a 250 mil flask and add 150 mils of a mixture of chloroform, 1 volume, and ether, 2 volumes. Stopper the flask, shake it well and allow it to stand ten minutes, then add 10 mils of ammonia water, shake the flask vigorously every ten minutes during two hours and allow it to stand for ten hours. Now add 25 mils of distilled water, again shake the flask well, and, when the drug has settled, decant 100 mils of the solution, representing 10 Gm. of Ignatia. Filter the solution through a pledget of purified cotton into a separator, and rinse the graduate and cotton with a little ether. Completely extract the alkaloids from the solution by shaking out repeatedly with weak sulphuric acid. Collect the acid washings in a separator, add ammonia water until the solution is decidedly alkaline to litmus, and completely extract the alkaloids by shaking out repeatedly with chloroform. Evaporate the combined chloroform washings to dryness, dissolve the alkaloids from the residue in exactly 10 mils of tenth-normal sulphuric acid V.S., and titrate the excess of acid with fiftieth-normal potassium hydroxide V.S., using cochineal T.S. or methyl red T.S. as indicator.

Each mil of tenth-normal sulphuric acid V.S. consumed corresponds to 36.4 milligrammes of the alkaloids of Ignatia.

AVERAGE DOSE—Metric, 0.06 Gm.—Apothecaries, 1 grain.

INULA

Inula

Elecampane

The dried rhizome and roots of *Inula Helenium* Linné (Fam. *Compositæ*), without the presence of more than 5 per cent. of its stem bases or other foreign matter.

Rhizome usually split into longitudinal or more or less oblique pieces to which may be attached one or more of the roots; up to 8 cm. in length and 4 cm. in diameter; externally grayish-brown to dark brown, longitudinally wrinkled with occasional buds or stem scars and surmounted at the crown by a portion of the over-ground stem; inner or cut surface somewhat concave, the edges incurved with the overlapping bark, yellowish-brown to grayish-brown, longitudinally striate and more or less fibrous near the cambium zone; fracture short and horny; inner surface light brown and marked by numerous circular or elliptical oleoresinous canals; roots cylindrical and tapering, frequently curved or irregularly curled, up to 13 cm. in length and 1.5 cm. in diameter. Odor aromatic; taste acrid, bitter and pungent.

Transverse sections under the microscope show a corky layer of from four to seven rows of broad tabular cells; a cortex of numerous parenchyma cells containing inulin in irregular or fan-shaped masses and a number of large, intercellular, oleoresinous reservoirs arranged in nearly radial rows and forming interrupted circles; woody portion consisting chiefly of parenchyma, a number of tracheæ with simple pores or reticulate thickenings and associated occasionally with a few, strongly lignified wood fibers, and oleoresinous reservoirs similar to those occurring in the bark; parenchyma cells in the pith of the rhizome large, containing less inulin than the cells of the wood and bark and separated by large intercellular spaces.

The powder is light brown; consisting chiefly of fragments of parenchyma containing inulin and small, irregular, separated masses of inulin; tracheæ with simple pores and reticulate thickenings associated occasionally with strongly lignified wood fibers; occasional reddish-brown fragments of the walls of the oleoresinous canals.

Inula yields not more than 10 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

IRIS

Orris

Orris Root

The rhizome of *Iris florentina* Linné, *Iris germanica* Linné or *Iris pallida* Lamarck (Fam. *Iridaceæ*), freed from the roots and peeled and dried.

In pieces of various forms and sizes, usually jointed and branched, from 5 to 10 cm. in length and from 1.5 to 3 cm. in width, rounded or flattened, with knotty enlargements; under surface shows numerous root scars, the upper with leaf scars; externally yellowish-white; internally light yellow; fracture hard, rough and at times mealy, showing a narrow cortex, a distinct endodermis and a large stele with numerous fibro-vascular bundles, especially near the endodermis. Odor fragrant, resembling that of violet flowers; taste slightly aromatic, bitterish, somewhat irritating.

The powder is light yellow and, when examined under the microscope, exhibits parenchyma cells of the cortex and the stele filled with characteristic starch grains, oval, rounded at one end and flattened at the other, some curved or with irregular protuberances, mostly single, from 0.02 to 0.05 mm. in diameter; cortical parenchyma cells irregularly polygonal, with thickened and porous walls and large intercellular spaces; endodermal cells tangentially elongated; elements of fibro-vascular bundles

with tracheæ showing spiral markings and from 0.01 to 0.025 mm. in width; calcium oxalate in large prisms, up to 0.5 mm. in length and 0.03 mm. in width, in intercellular spaces and in parenchyma with suberized walls. Cork cells, sclerenchyma cells and fibers absent.

Orris yields not less than 2 per cent. nor more than 5 per cent. of ash.

IRIS VERSICOLOR

Blue Flag

Iris Vers.

The dried rhizome of *Iris versicolor* Linné (Fam. *Iridaceæ*), without the presence of more than 5 per cent. of the roots and leaf bases.

Rhizome frequently branched, up to 10 cm. in length and 2 cm. in thickness, usually cut into longitudinal pieces; outer surface grayish-brown to purplish-brown, somewhat annulate, the upper surface with markings of leaf bases, the lower with numerous root scars and remnants; fracture short, the broken surface pale purplish-brown and exhibiting a central stele with whitish fibro-vascular bundles distributed throughout, a distinct endodermis, and cortex. Odor slight, not distinctive; taste acrid, nauseous.

The powder is light purplish-brown and, when examined under the microscope, exhibits numerous resin cells filled with yellow to brown resin; starch grains few, or, in some specimens, abundant, simple, or two- to four-compound, the simple grains being spherical or elliptical, up to 0.022 mm. in diameter; calcium oxalate in prisms, up to 0.35 mm. in length; tracheæ with spiral or reticulate markings or with bordered pores; sclerenchymatous fibers few, lignified and with oblique pores.

Blue Flag yields not more than 7 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

JUGLANS

Juglans

Juglan. Butternut Bark

The dried inner bark of the roots of *Juglans cinerea* Linné (Fam. *Juglandaceæ*), collected in the autumn.

In quills, curved strips, or in chips, from 3 to 10 mm. in thickness; of a deep brown color on both surfaces and throughout, except for the faint, intersecting, whitish, radial, and tangential lines shown in the transverse section; outer surface smooth, somewhat warty; inner surface smooth and striate, bearing fragments of thin stringy fiber; fracture short, rather weak, somewhat fibrous. Odor faintly aromatic; taste bitter, astringent, somewhat acrid.

The powdered drug is dark-brown and, when examined under the microscope, exhibits numerous rosette aggregate crystals of calcium oxalate, up to 0.050 mm. in diameter; simple rounded or occasionally 2- to 4-compound starch grains, the individual grains being up to 0.015 mm. in diameter, sometimes with a cleft through the center; stone cells, some with thick walls, with simple or branching pores, up to 0.10 mm. long and 0.05 mm. wide, sometimes with reddish contents; long thick-walled sclerenchymatous fibers up to 0.03 mm. in width, occasionally associated with crystal fibers, the latter containing prisms of calcium oxalate from 0.01 to 0.05 mm. in length; fragments of parenchyma containing brownish tannin masses and oil; fragments of epidermal tissue composed of polygonal cells having yellowish-brown walls, some with reddish-brown contents.

Juglans yields not more than 8 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

JUNIPERUS

Juniper Berries

Junip.

The carefully dried ripe fruit of *Juniperus communis* Linné (Fam. *Pinaceæ*). Preserve Juniper Berries in air-tight, tin or glass containers, and reject old or insect-infected fruit.

Nearly globular, about 8 mm. in diameter; externally smooth, shining black-brown to purplish-black with a blue-gray bloom, at the apex a three-rayed furrow marks the cohesion of the three fleshy bracts forming the pericarp; internally loosely fleshy, greenish-brown, containing numerous large schizogenous cavities; seeds three, triangular ovate, hard, brown, with large uneven oil glands on the surface. Odor aromatic; taste sweet, pleasant, terebinthinate, slightly bitter.

Sections, when examined under the microscope, exhibit a pericarp consisting of an epiderm of a single row of rounded polygonal cells filled with a brown granular substance, at the sutures of the bracts these become blunt papillæ; a hypodermis of two or three rows of brown-red, collenchymatous cells thickened at the angles; the fleshy portion (mesophyll) composed of loose irregular parenchyma with large oval canals and traversed by fibro-vascular bundles with areolated fibers; a sclerenchymatous ring of six to eight rows of very thick cells with pitted walls, many enclosing prismatic crystals of calcium oxalate; the seed-testa shows a layer of two to ten rows of stone cells with radial markings on the walls and each enclosing a polygonal crystal of calcium oxalate; endosperm and embryo rich in fat and aleurone.

Juniper Berries yield not more than 5 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm

KAOLINUM

Kaolin

(U.S.P. VIII)

A native hydrated aluminum silicate, powdered and freed from gritty particles by elutriation.

Kaolin occurs as a soft, white or yellowish-white powder, or in lumps, insoluble in water, and in cold dilute acids and solutions of the alkali hydroxides. It has an earthy or clay-like taste.

When moistened with water, Kaolin assumes a darker color and develops a marked clay-like odor.

Mix 1 Gm. of Kaolin with 10 mils of distilled water and 5 mils of sulphuric acid in a porcelain dish; no effervescence occurs. Evaporate the mixture until the excess of water is removed, and further heat the residue until dense white fumes of sulphuric anhydride appear, then add 20 mils of distilled water, boil for a few minutes and filter; there remains on the filter a gray residue of impure silica.

To one-half of the filtrate just obtained add ammonia water; a gelatinous precipitate of aluminum hydroxide is obtained which is insoluble in an excess of the reagent.

To the remaining half of the filtrate add sodium hydroxide T.S.; a gelatinous precipitate is produced which is completely or almost completely soluble in an excess of the reagent.

Rub 2 Gm. of Kaolin in a mortar with 10 mils of distilled water; the mixture does not acquire more than a slight reddish tint on the addition of 0.5 Gm. of sodium salicylate (*iron*).

Ignite Kaolin at a red heat; not less than 85 per cent. of a non-volatile residue remains.

KAVA

Kava

Kava Methysticum Kava Kava

The dried rhizome and roots of *Piper methysticum* Forster (Fam. *Piperaceæ*).

Consisting of a large, irregular knotty crown, often 12 cm. or more in diameter, from which proceed numerous, long, cylindrical, tough, nearly simple roots, which tend to fray out into bare, separated fibro-vascular bundles; the crown soft, light, spongy, and granular and very starchy; externally dark-brown or blackish, the crown frequently partly scraped and light brown to light gray; internally white. Odor faint but characteristic; taste aromatic and pungent, slightly bitter, more or less local anæsthesia resulting.

The powdered drug, when examined under the microscope, exhibits numerous, simple, or two- to three-compound starch grains, the individual grains being up to 0.045 mm. in diameter, many with radial clefts or triangular fissures at the center; yellow resin and oil cells; narrow sclerenchymatous fibers with thin, strongly-lignified walls; tracheæ with scalariform or reticulate markings, up to 0.15 mm. in width; few nearly isodiametric wood parenchyma from the remains of the stem.

Kava yields not more than 8 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

KOLA

Kola

Kola Cola

The dried cotyledons of several species of *Cola* Schott and Endlicher (Fam. *Sterculiaceæ*), yielding not less than 1.5 per cent. of caffeine.

Irregularly plano-convex, broadly oval, or approaching circular in outline, from 2.5 to 5 cm. in length, or triquetrous; heavy, hard and tough; brown with the outer surfaces slightly wrinkled, the inner surfaces lighter and smoother; edges slightly incurved and sharp. Odorless; taste slightly astringent.

The powdered drug is reddish-brown and, when examined under the microscope, exhibits numerous starch grains, some of which show alteration, the normal grains up to 0.045 mm. in diameter, the smaller ellipsoidal or spherical, the larger ellipsoidal or irregularly oblong and occasionally with a protuberance on one side; many of the larger grains show lamellæ and a circular point of origin of growth or a fissure through the center, and a distinct cross when examined with the polarizing microscope; parenchyma cells numerous, about 0.065 mm. in diameter, with reddish-brown walls.

Assay.—Introduce 6 Gm. of Kola, in No. 60 powder, into a flask and add 120 mils of chloroform and 6 mils of ammonia water. Stopper the flask, shake it frequently for half an hour, then let it stand four hours. Again shake the flask vigorously and, when the drug has settled, filter the liquid rapidly through a pledget of purified cotton and collect 100 mils of the filtrate, representing 5 Gm. of Kola. Evaporate the clear filtrate to dryness and dissolve the residue in 5 mils of weak sulphuric acid with the aid of a gentle heat. When the liquid has cooled, filter it into a separator and wash the container and filter with several small portions of distilled water. Now add ammonia water until the liquid is distinctly alkaline to litmus and shake out the alkaloid with successive portions of chloroform until completely extracted, as shown by testing with iodine T.S. Evaporate the united chloroform solutions and dry the residue to constant weight at 80° C. The weight is the amount of caffeine from 5 Gm. of Kola.

Kola yields not more than 3 per cent of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

KRAMERIA

Krameria

(U.S.P. VIII)

Kramer. Rhatany

The dried root of *Krameria triandra* Ruiz et Pavon, known in commerce as Peruvian Rhatany, or of *Krameria Ixina* Linné, known in commerce as Savanilla Rhatany, or *Krameria argentea* Martius, known in commerce as Para or Brazilian Rhatany (Fam. *Leguminosæ*), without the presence of more than 5 per cent. of stems or other foreign matter.

Peruvian Rhatany.—It consists of a knotty, several to many-headed crown with numerous branching roots, the latter rarely attaining a length of 50 cm. and usually less than 1 cm. in thickness, cylindrical, somewhat tapering, and flexuous or wavy; externally light reddish-brown or brownish-red, more or less marked with dark scaly cork, especially in the upper portion, otherwise nearly smooth, somewhat longitudinally wrinkled and devoid of transverse fissures, fracture of bark slightly fibrous, of wood tough and splintery, the pinkish-brown bark less than one-third of the radius, the wood yellowish or pinkish-white and finely radiate. Inodorous, wood nearly tasteless, bark astringent.

Savanilla Rhatany and Para Rhatany.—Roots usually separate, less flexuous and tapering than those of Peruvian Rhatany, and usually not exceeding 12 mm. in thickness; externally purplish-brown or chocolate-brown and marked with numerous transverse fissures; fracture less tough than that of Peruvian Rhatany; internally the bark and wood darker, the bark about two-fifths or more of the radius and more astringent than that of Peruvian Rhatany. Inodorous, wood nearly tasteless, bark astringent.

Powdered Krameria is reddish-brown; starch grains simple or two- to four-compound, the individual grains spherical, ellipsoidal, or plano-convex, and sometimes with a central, radial or star-like cleft, from 0.003 to 0.035 mm. in diameter; bast fibers more or less wavy in outline with very much attenuated ends and with non-lignified walls; tracheæ with simple or bordered pores associated with numerous wood fibers which are narrow-spindle shaped and with thick, porous, slightly lignified walls; numerous cellular fragments with yellowish or reddish-brown walls; calcium oxalate in monoclinic prisms, from 0.01 to 0.1 mm. in length, few or frequently absent.

Macerate 2 Gm. of powdered Krameria with 10 mils of alcohol, with occasional stirring for one hour, and filter. The deep reddish colored filtrate obtained yields a dark brownish-red precipitate and a deep orange-red filtrate upon the addition of an excess of alcoholic lead acetate T.S.; this latter filtrate yields no precipitate upon the further addition of a drop or two of alcoholic lead acetate T.S., and yields an olive-brown solution having a purplish fluorescence upon the addition of a drop or two of ferric chloride T.S.

Krameria yields not less than 9 per cent. of aqueous extractive and not more than 5 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

LAC VACCINUM

Cow's Milk

The fresh milk of the domestic cow, *Bos taurus* Linné (Fam. *Bovidæ*), without modification, and complying with the legal standards of the State or community in which it is sold.

LAPPA

Lappa

(U.S.P. VIII)

Burdock Root

The dried root of *Arctium Lappa* Linné, or of other species of *Arctium* (Fam. *Compositæ*), collected from plants of the first year's growth.

Nearly simple, fusiform, of variable length, from 5 to 20 mm. in diameter near the crown; frequently split or in broken pieces; externally grayish-brown, longitudinally wrinkled, the crown somewhat annulate, sometimes surmounted by a woolly tuft of leaf remains; fracture somewhat horny; a dark cambium separating the thick brownish bark from the yellowish porous and radiate wood, centrally hollow or containing a white, pith-like tissue. Odor slight; taste mucilaginous, sweetish, and slightly bitter.

The powder is light brown and, when examined under the microscope, exhibits parenchyma cells of the cortex; the medullary rays and wood containing amorphous masses or sphero-crystals of inulin; yellow resin cells occur in the cortical parenchyma of young roots; wood fibers few; no starch and no calcium oxalate.

Lappa yields not more than 6 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

LEPTANDRA

Leptandra

(U.S.P. VIII)

Leptand. Culver's Root

The dried rhizome and roots of *Veronica virginica* Linné (Fam. *Scrophulariaceæ*), without the presence of more than 5 per cent. of stems or other foreign matter.

Rhizome usually of horizontal growth, nearly cylindrical, somewhat branched; branches readily separable from the main rhizome, from 4 to 10 cm. in length and from 4 to 13 mm. in diameter; externally grayish-brown to dark reddish-brown, annulate from circular scars of bud-scales, upper surface with short stem remnants, occasionally with buds, and numerous circular stem-scars; from the under and lateral portions arise numerous coarse roots, fracture very tough and woody; internally, bark rather thin, dark brown and resinous, wood about the same thickness as the bark, light brown and porous, pith large, more or less hollow, the color being similar to that of the bark. Roots from 1 to 10 cm. in length and from 1 to 2 mm. in diameter; externally dark brown to purplish-brown, smooth and faintly longitudinally wrinkled; fracture short; internally with a thick brownish-black bark and small light brown central cylinder. Nearly odorless; taste very bitter and acrid.

The powder is brown to yellowish-brown; odor strong, penetrating; consisting of numerous irregular fragments, many of them being colored pink or violet upon the addition of hydrated chloral T.S.; starch grains numerous, mostly in the parenchymatous cells, the individual grains nearly spherical or more or less polygonal, and from 0.002 to 0.008 mm. in diameter; tracheæ with spiral thickenings or with simple or bordered pores; wood fibers with thick lignified walls, with simple pores or with bordered pores, resembling tracheids; fragments of parenchyma containing a light

brown or brownish-black resin, the latter frequently closely coherent with the starch grains in the cells thus preventing the separation of the individual starch grains; mounted in hydrated chloral T.S., occasional elongated cells with a lemon-yellow oily substance are observed.

Leptandra yields not more than 12 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

LITHII SALICYLAS

Lithium Salicylate

(U.S.P. VIII)

Lith. Salicyl.

It contains, when dried to constant weight at 120° C., not less than 98.5 per cent. of $LiC_7H_5O_3$ (143.98). Preserve it in well-closed containers, protected from heat and light.

Lithium Salicylate occurs as a white or grayish-white powder; deliquescent in a moist atmosphere; odorless; taste sweetish.

It is very soluble in water or alcohol.

When heated, the salt is decomposed, emitting the odor of phenol, and finally leaving a residue of lithium carbonate and carbon. It imparts a crimson color to a non-luminous flame.

An aqueous solution of the salt (1 in 20) is neutral or slightly acid to litmus, and when freshly made is colorless (*iron and organic coloring matter*); it does not effervesce upon the addition of diluted acids (*carbonate*).

Copper sulphate T.S. added to an aqueous solution of the salt (1 in 20) produces a bright green color.

Add a few drops of ferric chloride T.S. to an excess of an aqueous solution of the salt (1 in 4); a deep red color is produced. In a dilute solution of the salt (1 in 100) ferric chloride T.S. produces a deep violet-blue color.

Hydrochloric acid added to an aqueous solution of the salt (1 in 20) produces a voluminous white precipitate of salicylic acid.

Dissolve 0.7 Gm. of the salt in 10 mils of distilled water, add an excess of hydrochloric acid and filter. Evaporate the filtrate almost to dryness on a water bath, in a 50 mil Erlenmeyer flask, and then add 10 mils of amyl alcohol and cautiously heat until the lower aqueous layer is evaporated; then add three drops of hydrochloric acid and boil the liquid for three minutes; the insoluble residue weighs not more than 0.005 Gm. (*other alkalies*). (The removal of the water from the amyl alcohol mixture is facilitated by passing a current of air through the hot solution.)

Dissolve 1 Gm. of the salt in 50 mils of distilled water, precipitate the salicylic acid by the addition of a slight excess of hydrochloric acid and filter; the filtrate does not respond to the Test for heavy metals (see page 357).

Assay.—Incinerate in a porcelain crucible about 2 Gm. of Lithium Salicylate, previously dried to constant weight at 120° C. and accurately weighed, and proceed as directed under the Assay for alkali salts of organic acids (see page 358). It shows, in the dried salt, not less than 98.5 per cent. of $LiC_7H_5O_3$.

Each mil of half-normal sulphuric acid V.S. used corresponds to 0.07199 Gm. of $LiC_7H_5O_3$. Each gramme of Lithium Salicylate, previously dried, at 120° C., corresponds to not less than 13.7 mils of half-normal sulphuric acid V.S.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

LUPULINUM

Lupulin

(U.S.P. VIII)

Lupul.

The glandular trichomes separated from the strobiles of *Humulus Lupulus* Linné (Fam. *Moraceæ*). Preserve it in tightly-closed containers, protected from light.

A bright yellowish-brown, granular powder, having the characteristic odor and taste of hops; becoming darker in color, disagreeable and valerian-like in odor on aging, when it is unfit for use.

Under the microscope, the glandular trichomes are somewhat globular or ellipsoidal, from 0.15 to 0.2 mm. in diameter, consisting of a single layer of secreting cells assuming the form of a shallow cup, from the inner surface of which the cuticle has been separated by the secreted yellowish-brown oleoresin.

Not less than 60 per cent. of Lupulin is soluble in ether.

Lupulin yields not more than 16 per cent. of ash.

AVERAGE DOSE—Metric, 0.5 Gm.—Apothecaries, 8 grains.

MACIS

Mace

The arillode of the seed of *Myristica fragrans* Houttuyn (Fam. *Myristicaceæ*).

In narrow bands, 25 mm. or more in length, somewhat branched and lobed above, united into broader bands below; yellowish to brownish-orange, and oily. Odor fragrant; taste warm and aromatic.

The powder is orange-buff to orange-brown. Mounted in water and examined microscopically, the powder exhibits elongated epidermal cells; parenchyma containing very small amylodextrin granules, which are colored red-brown by iodine T.S.; large oil cells the contents of which are not greatly changed in color on the addition of alkali.

Powdered false Mace or Bombay Mace is yellow-brown to deep-brown in color and deficient in odor and taste. When mounted in water and examined microscopically it exhibits flattened, thick-walled epidermal cells and oil cells much more numerous than in true Mace and containing an orange-red resinous substance which is dissolved by alkalies forming a blood-red liquid.

Moisten Mace with hydrochloric acid; no greenish color is produced (difference from and absence of the *arillode of Myristica malabarica* Lamarck or *Bombay Mace*).

Add potassium chromate T.S. to an alcoholic extract of Mace (1 in 10); the precipitate formed is yellow and does not change to red on standing, nor does the solution develop a red coloration (difference from and absence of *Bombay Mace*).

Saturate a piece of filter paper with an alcoholic tincture of Mace (1 in 10), and add one drop of potassium hydroxide T.S.; no blood-red coloration is produced (difference from and absence of *Bombay Mace*).

Mace yields not less than 8 per cent. of volatile ether extract, and not less than 20 per cent. nor more than 30 per cent. of non-volatile ether extract (see pages 359 and 360).

Mace yields not more than 3 per cent. of ash which is almost completely soluble in hydrochloric acid.

AVERAGE DOSE—Metric, 0.5 Gm.—Apothecaries, 8 grains.

MAGNESII CHLORIDUM

Magnesium Chloride

Mag. Chlorid.

It contains not less than 95 per cent. of $MgCl_2 + 6H_2O$ (203.34).

Magnesium Chloride occurs as colorless, transparent crystals, or as white, translucent pieces; deliquescent in moist air.

One gramme dissolves in about 0.6 mil of water; it is readily soluble in alcohol.

The aqueous solution of the salt (1 in 20) is neutral to litmus paper.

An aqueous solution of the salt, acidulated with nitric acid, yields a white precipitate upon the addition of silver nitrate T.S.

A mixture of 10 mils of an aqueous solution of the salt (1 in 20) with 10 mils of ammonium chloride T.S., rendered slightly alkaline with ammonia water, yields a white precipitate on the addition of sodium phosphate T.S.

One Gm. of the salt dissolves in 10 mils of alcohol, leaving not more than 1 per cent. of insoluble residue (*substances insoluble in alcohol*).

Add 1 mil of potassium sulphate T.S. to 10 mils of an aqueous solution of the salt (1 in 20), slightly acidulated with hydrochloric acid; no turbidity results (*barium*).

Ten mils of an aqueous solution of the salt (1 in 200), acidulated with hydrochloric acid, is not reddened by potassium sulphocyanate T.S. (*iron*).

Warm 5 mils of an aqueous solution of the salt (1 in 10) with 10 mils of sodium hydroxide T.S.; the odor of ammonia is not evolved.

A mixture of 10 mils of an aqueous solution of the salt (1 in 20), 10 mils of ammonium chloride T.S. and 5 mils of ammonia water, is not rendered more than slightly turbid upon the addition of ammonium oxalate T.S. (*calcium*).

An aqueous solution of the salt does not respond to the Test for heavy metals (see page 357).

An aqueous solution of the salt meets the requirements of the Test for arsenic (see page 356).

Assay.—Dissolve about 0.5 Gm. of Magnesium Chloride, previously dried and accurately weighed, in 50 mils of distilled water in a 200 mil measuring flask; add 3 mils of nitric acid, then add 50 mils of tenth-normal silver nitrate V.S. and sufficient distilled water to make the mixture measure 200 mils. Mix thoroughly, filter through a dry filter, reject the first 20 mils of filtrate, then collect 100 mils of filtrate, add 2 mils of ferric ammonium sulphate T.S. and titrate the excess of silver nitrate with tenth-normal potassium sulphocyanate V.S.

Each mil of tenth-normal silver nitrate V.S. used corresponds to 0.010167 Gm. of $MgCl_2 + 6H_2O$. Each gramme of magnesium chloride corresponds to not less than 93.4 mils of tenth-normal silver nitrate V.S.

AVERAGE DOSE—Metric, 15 Gm.—Apothecaries, 4 drachms.

MALVÆ FOLIA

Mallow Leaves

Malv. Fol.

The dried leaves of *Malva sylvestris* Linné and of *Malva rotundifolia* Linné (Fam. *Malvaceæ*). Reject leaves showing brown fungous growths of *Puccinia Malvacearum* Montagne.

Leaves of *Malva sylvestris*, petiolate with petioles up to 10 cm. in length, orbicular or reniform, slightly truncate or cordate at the base, from 10 to 11 cm. in length, and from 15 to 20 cm. in width, with three to seven shallow, angular or rounded lobes,

venation palmate, margins crenate-dentate, pubescent on both sides. Leaves of *Malva rotundifolia*, with petioles up to 20 cm. in length, orbicular up to 8 cm. in width, base deeply cordate, five to seven shallow rounded lobes, venation palmate, margins with rounded blunt teeth, pubescence more scant than in *M. sylvestris*. Intermixed with the leaves are frequently found dark purple flowers and glabrous reticulated carpels (*M. sylvestris*) or pale bluish flowers and pubescent rounded carpels (*M. rotundifolia*). Inodorous; on chewing it becomes very mucilaginous, taste bland.

When examined under the microscope, sections show an epidermis containing mucilage cells; numerous stomata, on both surfaces, each with three or four neighboring cells; trichomes of three distinct types, small, short-stalked glandular hairs, single, large, one-celled curved hairs with thick walls and compound or stellate hairs in groups of two- to six-cells (the latter especially numerous in *M. sylvestris*); palisade tissue of one or two rows of cells, the mesophyll of three or four rows; the parenchyma containing calcium oxalate in rosette crystals and numerous mucilage cells which are distributed in the tissue of the veins; veins with collateral bundles.

The powder is light green and, when examined under the microscope, exhibits the characteristic hairs, mucilage cells, epidermis with stomata, and rosette crystals of calcium oxalate.

Mallow Leaves yield not more than 16 per cent. of ash.

MANGANI CITRAS SOLUBILIS

Soluble Manganese Citrate

Mangan. Cit. Sol. Manganese and Sodium Citrate

Manganous citrate rendered soluble by the aid of sodium citrate. It corresponds, when dried to constant weight at 120° C., to not less than 49 per cent. nor more than 51 per cent. of $Mn_3(C_6H_5O_7)_2$ (542.87). Preserve it in well-closed containers.

Soluble Manganese Citrate occurs as a yellowish or pinkish-white powder, or as translucent scales; odorless, and having a slightly bitter and astringent taste. It is permanent in the air.

One gramme dissolves slowly in about 4 mils of water; slightly more soluble in boiling water, nearly insoluble in alcohol.

An aqueous solution of Soluble Manganese Citrate (1 in 20) is neutral or slightly alkaline to litmus, but does not redden phenolphthalein T.S.

When strongly heated, it chars and finally leaves a residue which effervesces with acids and imparts an intensely yellow color to a non-luminous flame.

An aqueous solution of Soluble Manganese Citrate (1 in 20), rendered alkaline with ammonia water, yields a salmon-colored precipitate on warming with ammonium sulphide T.S.

Ten mils of an aqueous solution of Soluble Manganese Citrate (1 in 20), slightly acidulated with acetic acid and mixed with 2 mils of calcium chloride T.S., remains clear while cold, but yields a white crystalline precipitate when heated to boiling.

Separate portions of 10 mils each of an aqueous solution of Soluble Manganese Citrate (1 in 100), when acidulated with hydrochloric acid, are not more than slightly reddened by potassium sulphocyanate T.S. (*iron*); nor rendered turbid at once by barium chloride T.S. (*sulphate*); nor show more than an opalescence with silver nitrate T.S. when acidulated with nitric acid (*chloride*).

Mix about 0.5 Gm. of Soluble Manganese Citrate with 5 mils of sulphuric acid in a porcelain dish previously rinsed with sulphuric acid, protect the mixture from dust, and heat it for fifteen minutes on a water bath; no color darker than yellow develops (*tartrates or other readily carbonizable substances*).

An aqueous solution of Soluble Manganese Citrate does not respond to the Test for heavy metals (see page 357).

Assay.—Dissolve about 0.5 Gm. of Soluble Manganese Citrate, previously dried to constant weight at 120° C. and accurately weighed, in 100 mils of distilled water, add 50 mils of solution of hydrogen dioxide, and 10 mils of ammonia water, and boil the mixture for several minutes. Collect the precipitate on a filter, wash it thoroughly with hot distilled water, dry and ignite to constant weight. The weight of the manganous-manganic oxide (Mn_3O_4) so obtained is not less than 20.65 per cent. nor more than 21.5 per cent. of the weight of the salt taken, corresponding to not less than 49 per cent. nor more than 51 per cent. of $Mn_3(C_6H_5O_7)_2$.

Each gramme of manganous-manganic oxide is equivalent to 2.3728 Gm. of $Mn_3(C_6H_5O_7)_2$.

Average dose—Metric, 0.2 Gm.—Apothecaries, 3 grains.

MANGANI GLYCEROPHOSPHAS SOLUBILIS

Soluble Manganese Glycerophosphate

Mangan. Glycerophos. Sol. Soluble Manganous Glycerinophosphate

Manganous Glycerophosphate rendered soluble by the aid of citric acid. It contains not less than 70 per cent. nor more than 75 per cent. of $MnC_3H_7PO_6$ (225.03). Preserve it in well-closed containers.

Soluble Manganese Glycerophosphate occurs as a yellowish or pinkish-white powder, odorless, and having an acid taste.

One gramme dissolves in 4 mils of water at 25° C. The aqueous solution is strongly acid to litmus and becomes turbid on heating. Alcohol dissolves the citric acid, leaving a residue which is nearly insoluble in water.

Add an excess of ammonium sulphide T.S. to an aqueous solution of Soluble Manganese Glycerophosphate; on standing, it yields a salmon-colored precipitate soluble in acetic acid.

No yellow turbidity is produced immediately on mixing 5 mils of an aqueous solution (1 in 20) with 10 mils of ammonium molybdate T.S. (*phosphate*), but on prolonged standing, or on heating, a yellow precipitate is formed.

Heat a powdered mixture of about 0.1 Gm. of Soluble Manganese Glycerophosphate and about 0.5 Gm. of potassium bisulphate; pungent vapors of acrolein are evolved.

Separate portions of 10 mils each of an aqueous solution of Soluble Manganese Glycerophosphate (1 in 20) are not rendered more than slightly turbid by barium chloride T.S. when mixed with a few drops of hydrochloric acid (*sulphate*); nor by silver nitrate T.S., after acidulation with nitric acid (*chloride*).

Add a few drops of hydrochloric acid and 1 mil of chlorine T.S. to 10 mils of an aqueous solution of Soluble Manganese Glycerophosphate (1 in 200) and boil; no reddish color is produced in the liquid by potassium sulphocyanate T.S. after cooling (*iron*).

An aqueous solution of Soluble Manganese Glycerophosphate does not respond to the Test for heavy metals (see page 357).

Assay.—Dissolve about 0.5 Gm. of Soluble Manganese Glycerophosphate, accurately weighed, in 100 mils of distilled water, add 10 mils of ammonia water and 5 mils of ammonium sulphide T.S. and boil the mixture until the precipitate formed has become greenish. Allow the precipitate to settle, then transfer it to a filter, wash with hot distilled water containing a few drops of ammonium sulphide T.S., dry the filter and contents and incinerate them in an open crucible, first at a low temperature and then at strong red heat, until the weight is constant. The residue of manganous-manganic oxide (Mn_3O_4) so obtained is not less than 23.7 per cent. nor more than 25.4 per cent. of the weight taken, corresponding to not less than 70 per cent. nor more than 75 per cent. of $MnC_3H_7PO_6$.

Each gramme of manganous-manganic oxide is equivalent to 2.95 Gm. of $MnC_3H_7PO_6$.

Average dose—Metric, 0.2 Gm.—Apothecaries, 3 grains.

MANGANI HYPOPHOSPHIS

Manganese Hypophosphite

(U.S.P. VIII)

Mangan. Hypophos.

It contains not less than 97 per cent. of $Mn(PH_2O_2)_2 + H_2O$ (203.06). Preserve it in well-closed containers.

Manganese Hypophosphite is a pink, granular or crystalline powder; odorless and nearly tasteless; permanent in the air.

It is freely soluble in water; insoluble in alcohol.

An aqueous solution of the salt (1 in 20) is neutral or acid to litmus, and yields with ammonium sulphide T.S. a salmon-colored precipitate of manganese sulphide, soluble in acetic acid.

When strongly heated in a dry test tube, the salt evolves spontaneously inflammable hydrogen phosphide and finally leaves a residue of manganous pyrophosphate.

When an aqueous solution of the salt (1 in 20), acidulated with hydrochloric acid, is added, drop by drop with agitation, to an excess of mercuric chloride T.S., a white precipitate of mercurous chloride is formed, and, upon the further addition of the solution of Manganese Hypophosphite, the precipitate becomes gray from reduction to metallic mercury.

Add about 0.5 Gm. of the salt to 5 mils of acetic acid; no effervescence is produced (*carbonate*).

Boil 0.25 Gm. of the salt with 10 mils of sodium hydroxide T.S.; a white precipitate is formed which gradually acquires a brown color on exposure to the air. The filtrate from this mixture, after being slightly acidulated with hydrochloric acid, boiled for a minute, and then rendered alkaline with ammonia water, yields no precipitate upon the addition of magnesia mixture T.S. (*phosphate*).

Dissolve 1 Gm. of the salt in 20 mils of diluted hydrochloric acid with the aid of heat, and then add 1 mil of barium chloride T.S.; not more than a slight turbidity is produced (*sulphate*).

Dissolve 0.5 Gm. of Manganese Hypophosphite in 10 mils of hot distilled water, add 10 mils of solution of hydrogen dioxide and 10 mils of sodium hydroxide T.S., boil for one minute, then render slightly acid with acetic acid and again warm. Now cool, filter, and add 1 mil of ammonium oxalate T.S. to 10 mils of the filtrate; no turbidity is produced within five minutes (*calcium*).

Pour 5 mils of an aqueous solution of the salt (1 in 30) into an evaporating dish containing 3 mils of nitric acid diluted with about 10 mils of distilled water, and evaporate to dryness on a water bath; the residue does not respond to the Test for arsenic (see page 356).

Assay.—Dissolve about 1 Gm. of Manganese Hypophosphite, accurately weighed, in 30 mils of boiling distilled water in a 250 mil measuring flask. Add 25 mils of solution of hydrogen dioxide and 15 mils of sodium hydroxide T.S. and heat for ten minutes on a water bath with frequent agitation. Cool, add distilled water to make the volume exactly 250 mils, mix well and filter through a dry filter. Evaporate 25 mils of the clear filtrate to dryness with 10 mils of nitric acid, dissolve the residue in 10 mils of distilled water, transfer it to a 100 mil flask with the aid of a few mils of distilled water, add a drop of phenolphthalein T.S. and sufficient sodium hydroxide T.S. (free from chloride) to produce a pink color, then add 50 mils of tenth-normal silver nitrate V.S. and agitate the mixture well. Now gradually add zinc oxide (free from chloride) in small portions, agitating vigorously after each addition until the liquid is neutral to litmus. Then add distilled water to make 100 mils, agitate the mixture thoroughly, filter through a dry filter, collect 50 mils of the filtrate, add 2 mils of nitric acid and 2 mils of ferric ammonium sulphate T.S., and titrate with tenth-normal potassium sulphocyanate V.S. to the production of a permanent red color. It shows not less than 97 per cent. of $Mn(PH_2O_2)_2 + H_2O$.

Each mil of tenth-normal silver nitrate V.S. used corresponds to 0.003384 Gm. of $Mn(PH_2O_2)_2 + H_2O$. Each gramme of Manganese Hypophosphite corresponds to not less than 286.6 mils of tenth-normal silver nitrate V.S.

AVERAGE DOSE—Metric, 0.2 Gm.—Apothecaries, 3 grains.

MANGANI SULPHAS

Manganese Sulphate

(U.S.P. VIII)

Mangan. Sulph.

It contains not more than 38 per cent. of water, and not less than 62 per cent. nor more than 68 per cent. of $MnSO_4$ (151.00).

Manganese Sulphate occurs as pale rose-colored, translucent, tetrahedral prisms; slightly efflorescent when exposed to moist air. Odorless; taste slightly bitter and astringent.

One gramme of the salt dissolves in about 1 mil of water at 25° C., and in about 0.6 mil of boiling water; insoluble in alcohol.

An aqueous solution of the salt (1 in 20) is neutral or slightly acid to litmus. It yields with ammonium sulphide T.S. a salmon-colored precipitate soluble in dilute acids; and with barium chloride T.S. a white precipitate insoluble in hydrochloric acid.

Mix a fragment of Manganese Sulphate with a small amount of sodium hydroxide and fuse the mixture; it yields a green mass which dissolves in water to form a green solution.

Add a few drops each of hydrochloric acid and of chlorine water to 20 mils of an aqueous solution of the salt (1 in 100), boil until the excess of chlorine is removed and then cool; it is not colored red by potassium sulphocyanate T.S. (*iron*).

The addition of a few drops of silver nitrate T.S. to 10 mils of an aqueous solution of the salt (1 in 100), previously mixed with a few drops of nitric acid, does not at once produce more than an opalescence (*chloride*).

Precipitate the manganese completely from a solution of 1 Gm. of the salt in 50 mils of distilled water by the addition of ammonium carbonate T.S. and filter; the filtrate evaporated and gently ignited leaves a residue weighing not more than 0.005 Gm. (*other salts or alkalies*).

A solution of 1 Gm. of the salt and 1 Gm. of sodium acetate in 10 mils of distilled water, to which a few drops of acetic acid have been added, is not affected by hydrogen sulphide T.S. (*zinc*).

Ignite 1 Gm. of the salt, in a porcelain crucible; it loses not more than 38 per cent. of its weight (distinction from *Manganese Sulphate containing a larger amount of water of crystallization*).

An aqueous solution of the salt, slightly acidulated with hydrochloric acid, does not respond to the Test for heavy metals (see page 357).

Assay.—Dissolve about 0.6 Gm. of Manganese Sulphate, accurately weighed, in 100 mils of distilled water, add 10 mils of ammonia water and 30 mils of solution of hydrogen dioxide and boil the mixture until precipitation is complete. Transfer the mixture to a filter and wash the precipitate with distilled water until barium chloride T.S. ceases to produce a precipitate in the filtrate, then dry the filter and precipitate and incinerate these, first at a low heat and then at a strong red heat, until of constant weight. The weight of the residue of manganous-manganic oxide (Mn_3O_4) so obtained corresponds to not less than 31.3 per cent. nor more than 34.34 per cent. of the salt taken.

Each gramme of manganous-manganic oxide is equivalent to 1.98 Gm. of $MnSO_4$.

AVERAGE DOSE—Metric, 0.2 Gm.—Apothecaries, 3 grains.

MASTICHE

Mastic

(U.S.P. VIII)

Mastic.

A concrete resinous exudation from *Pistacia Lentiscus* Linné (Fam. *Anacardiaceæ*).

In sub-globular, lenticular, elongated or pear-shaped tears, about 3 mm. in diameter, pale yellow or greenish-yellow, transparent, having a glass-like luster, the surface sometimes very slightly dusty; brittle, becoming plastic when chewed. Odor slight, balsamic; taste mild, terebinthinate.

Mastic is completely soluble in ether and almost completely soluble in alcohol. The acid number, determined as directed by the U. S. Pharmacopœia, is not less than 65.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

MATICO

Matico

(U.S.P. VIII)

Matic.

The dried leaves of *Piper angustifolium* Ruiz et Pavon (Fam. *Piperaceæ*), without the presence of more than 5 per cent. of stems, flower spikes, or other foreign matter.

Usually in compressed, matted masses with leaves more or less broken; leaves sub-sessile, lanceolate, from 10 to 20 cm. in length and from 2 to 5 cm. in breadth; summit tapering and acute; base slightly unequal, cordate; margin finely crenulate; upper surface dark green, tessellated; lower surface pale green, reticulate with prominent, yellowish-brown midrib and veins forming small quadrangular meshes clothed with matted pubescence. Odor distinct, aromatic; taste pungent, pepper-like.

Sections, when examined under the microscope, exhibit the epidermis of the upper side composed of regular polygonal cells and of the lower side of somewhat irregular and undulate cells, especially where covering the veins; numerous stomata with large neighboring cells on the lower side; the hypodermis of one row and palisade cells in two or three rows; mesophyll loose, spongy tissue; midrib in cross section oval, outer layer of thick-walled cork cells; secretion cells filled with yellow oil; upper surface with papillæ and few bristly hairs; hairs of the lower surface of two kinds, the one six to ten cells in length, pointed, bent and matted, having thick walls and astriate cuticle; the other bristle hairs of one stem cell and a head cell; calcium oxalate crystals few in parenchyma tissue of the venation, in the form of raphides or monoclinic prisms.

The powder is greenish-yellow and, when examined under the microscope, exhibits the characteristic hairs, polygonal epidermal cells, and secretion cells of the leaf.

Matico yields not more than 18 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

MELILOTUS

Melilot

Melilot. Yellow Melilot Yellow Sweet Clover

The dried leaves and flowering tops of *Melilotus officinalis* (Linné) Lamarck (Fam. *Leguminosæ*).

Stems mostly less than 3 dm. in length, slender, straight, mostly simple, often leafy below, terminating in long slender racemes, the younger portions very finely pubescent; leaves glabrous or nearly so; petiolate, trifoliate, stipulate, the stipules subulate, entire, the leaflets from 1 to 3 cm. in length, varying from narrowly oblong to oval or occasionally broader above the middle, rounded, truncate, or slightly notched at the summit, sharply serrate; racemes 1 dm. or less in length, many flowered, the flowers yellow, from 5 to 6 mm. in length; calyx bell-shaped, the fine, nearly equal lobes shorter than the tube, corolla papilionaceous, the keel shorter than the other petals, which are about equal; legumes reflexed, from 2.5 to 3.5 mm. in length, obovate, wrinkled, one-seeded. Odor aromatic, tonka-like; taste sweetish, slightly pungent and bitter.

Melilot yields not more than 10 per cent. of ash.

MENYANTHES

Menyanthes

Menyanth. Buckbean Marsh Trefoil

The dried leaves of *Menyanthes trifoliata* Linné (Fam. *Gentianaceæ*).

Glabrous; petioles from 10 to 15 cm. in length, stout but soft and weak, the base more or less sheathed with broad, thin, and membranaceous, somewhat translucent stipules; blade ash-green, trifoliate; leaflets sessile or very short-petioled from 5 to 8 cm. in length and usually about two-thirds as broad, obovate, blunt, entire or occasionally coarsely and unequally crenate. Odor slight but characteristic; taste decidedly bitter.

Menyanthes yields not more than 10 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

MYRICA

Bayberry Bark

The dried bark of the root of *Myrica cerifera* Linné (Fam. *Myricaceæ*), without the presence of more than 5 per cent. of adhering wood.

In quills or quilled pieces or strips, of variable length and up to 20 mm. in breadth, the bark rarely exceeding 2 mm. in thickness; outer surface varying from dark-brown to gray-brown, occasionally slightly silvery, somewhat lustrous, at least in patches, bearing occasional warts or slight transverse ridges, the periderm frequently much wrinkled; inner surface deep rusty-brown, finely short-striated and somewhat roughened; fracture short and weak, light brown in the outer layer, yellowish-brown in the inner layer. Odor characteristic, rather disagreeable; taste astringent, mildly bitter and slightly acrid.

The powder is reddish-brown and, when examined under the microscope, exhibits crystals of calcium oxalate in monoclinic prisms up to 0.02 mm. in diameter, or in rosette aggregates up to 0.035 mm. in diameter; numerous simple, or two- to four-compound starch grains, up to 0.012 mm. in diameter; strongly lignified, porous bast fibers with walls about 0.02 mm. in thickness, often accompanied by crystal fibers; rounded or irregular stone cells, usually in groups, with thick, lignified, lamellated, porous walls; cork cells polygonal in surface view, some with brownish walls and filled with reddish contents; fragments of parenchyma, some of the cells rich in starch; tracheæ with bordered pores from adhering wood very few or absent.

Myrica yields not more than 6 per cent. of ash.

AVERAGE DOSE—Metric, 0.5 Gm.—Apothecaries, 8 grains.

OLEUM AURANTII AMARI

Oil of Bitter Orange

Ol. Aurant. Amar.

A volatile oil obtained by expression from the fresh peel of the bitter orange, *Citrus Aurantium amara* Linné (Fam. *Rutaceæ*). Preserve it in small, well-stoppered, amber-colored bottles, in a cool place, protected from light. Oil of Bitter Orange having a terebinthinate odor is not to be dispensed.

Oil of Bitter Orange is a pale yellow liquid, having the characteristic, aromatic odor of the Seville orange, and an aromatic somewhat bitter taste.

Soluble in 4 volumes of alcohol, the solution being neutral to litmus paper. Also soluble in all proportions in dehydrated alcohol and in an equal volume of glacial acetic acid.

Specific gravity: 0.842 to 0.848 at 25° C.

It is dextrorotatory, the angle of rotation varying from +92° to +98°, in a 100 mm. tube, at 25° C.

Introduce 50 mils of Oil of Bitter Orange into a 200 mil, three-bulb, fractionating flask. Distil the Oil at the rate of 2 mils per minute until a distillate measuring 5 mils has been collected. The angle of rotation of this distillate is equal to, or only slightly lower than, that of the original Oil.

AVERAGE DOSE—Metric, 0.2 mil—Apothecaries, 3 minims.

OLEUM AURANTII FLORUM

Oil of Orange Flowers

Ol. Aurant. Flor. Oil of Neroli

A volatile oil distilled from the fresh flowers of the bitter orange, *Citrus Aurantium amara* Linné (*Citrus vulgaris* Risso, *Citrus Bigaradia* Risso) (Fam. *Rutaceæ*). Preserve it in small, amber-colored, well-stoppered bottles in a cool place, protected from light.

Oil of Orange Flowers is a pale yellow, slightly fluorescent, neutral liquid, having a distinctive fragrant odor similar to that of orange blossoms and an aromatic, at first sweet then somewhat bitter taste.

It is soluble in an equal volume of alcohol, the solution having a violet fluorescence and a neutral reaction to litmus paper. Also soluble in two volumes of 80 per

cent. alcohol, the solution becoming cloudy on the further addition of alcohol of the same percentage.

Specific gravity: 0.868 to 0.880 at 25° C.

It is dextrorotatory, the angle of rotation varying from +1° 30′ to +5°, in a 100 mm. tube, at 25° C.

When agitated with a concentrated solution of sodium bisulphate it assumes a permanent purple-red color.

OLEUM BERGAMOTTÆ

Oil of Bergamot

Ol. Bergam.

A volatile oil obtained by expression from the rind of the fresh fruit of *Citrus Aurantium Bergamia* (Risso et Poiteau) Wight et Arnott (Fam. *Rutaceæ*), and containing not less than 36 per cent. of ester, calculated as linalyl acetate. Preserve it in small, amber-colored, well-stoppered bottles in a cool place, protected from light.

Oil of Bergamot is a green or greenish-yellow liquid, neutral or only faintly acid, having a characteristic fragrant odor and an aromatic bitter taste.

Two volumes of the Oil, when mixed with 1 volume of alcohol, give a clear solution and this does not become turbid on the further addition of alcohol. It is soluble in 2 volumes of 80 per cent. alcohol with not more than a slight cloudiness, and no separation of oil globules. Also soluble in all proportions in glacial acetic acid.

Specific gravity: 0.875 to 0.880 at 25° C.

It is dextrorotatory, the angle of rotation varying from +8° to +24°, in a 100 mm. tube, at 25° C.

Evaporate in a tared dish on a water bath about 2 Gm. of the Oil, accurately weighed, until the odor has completely disappeared; a soft green residue remains, corresponding to not more than 6 per cent. of the Oil (*fixed oils*).

To 2 Gm. of Oil of Bergamot add 10 mils of alcoholic potassium hydroxide V.S., free from chloride, evaporate to dryness and incinerate. Extract the ash with distilled water and acidify with diluted nitric acid; no cloudiness is produced on the addition of silver nitrate T.S. (*chlorinated compounds*).

Assay.—To 2 Gm. of the Oil add 20 mils of half-normal alcoholic potassium hydroxide V.S. and heat the mixture in a flask on a water bath, under a reflux condenser, for a half hour. Cool the mixture, add 100 mils of distilled water and titrate with half-normal sulphuric acid V.S., using phenolphthalein T.S. as indicator. Not more than 12.6 mils of half-normal sulphuric acid V.S. is required, corresponding to not less than 36 per cent. of ester, calculated as linalyl acetate, in the Oil.

Each mil of half-normal potassium hydroxide V.S. consumed corresponds to 0.09808 Gm. of ester, calculated as linalyl acetate.

OLEUM BETULÆ EMPYREUMATICUM RECTIFICATUM

Rectified Oil of Birch Tar

Ol. Bet. Empyr. Rect.

Rectified Empyroligneous Oil of Birch Oleum Rusci Rectificatum

The pyroligneous oil obtained by the dry distillation of the bark and wood of *Betula alba* Linné (Fam. *Betulaceæ*), rectified by steam distillation.

Rectified Oil of Birch Tar is a limpid, dark brown liquid having a penetrating, empyreumatic odor resembling that of Russian leather.

It yields clear solutions with 3 volumes of dehydrated alcohol, and with ether, chloroform, glacial acetic acid, amyl alcohol, oil of turpentine, benzene, or carbon disulphide. When mixed with 3 volumes of alcohol or purified petroleum benzin, the solution is not more than slightly turbid but a decided turbidity is produced when mixed with the same volume of methyl alcohol.

Specific gravity: 0.886 to 0.950 at 25° C.

Warm 2 mils of the Oil with 10 mils of distilled water, agitate and allow the mixture to cool; separate and filter the aqueous liquid. The filtrate is colorless, has a strong, empyreumatic odor and an acid reaction. Add two drops of potassium dichromate T.S. to 4 mils of the same aqueous filtrate; it produces a bright yellow solution which soon becomes darker and turbid. Add one drop of dilute ferric chloride solution (1 in 100) to 4 mils of the filtrate; it produces a green coloration which changes to brown and becomes turbid (distinction from *oil of cade*).

OLEUM CARDAMOMI

Oil of Cardamom

Ol. Cardam.

A volatile oil distilled from the seeds of *Elettaria Cardamomum* White et Maton (Fam. *Zingiberaceæ*). Preserve it in small, well-stoppered, amber-colored bottles, in a cool place, protected from light.

Oil of Cardamom is a colorless or very pale yellow liquid having the characteristic, aromatic, penetrating and somewhat camphoraceous odor of cardamom, and a persistent, pungent, and strongly aromatic taste.

It is very soluble in alcohol and readily soluble in four volumes of 70 per cent. alcohol, forming a clear solution.

Specific gravity: 0.924 to 0.947 at 25° C.

It is dextrorotatory, the angle of rotation varying from +22° to +44°, in a 100 mm. tube, at 25° C.

OLEUM MYRCIÆ

Oil of Myrcia

Ol. Myrc. Oil of Bay

A volatile oil distilled from the leaves of *Pimenta acris* (Swartz) Wight (Fam. *Myrtaceæ*). Preserve it in small, well-stoppered, amber-colored bottles, in a cool place, protected from light.

Oil of Myrcia is a yellow or brownish-yellow liquid having a pleasant, aromatic odor and a pungent, spicy taste.

With an equal volume of alcohol, glacial acetic acid, or carbon disulphide, it yields slightly turbid solutions. An alcoholic solution is slightly acid to litmus paper.

Specific gravity: 0.962 to 0.990 at 25° C.

It is lævorotatory, the angle of rotation not exceeding −3°, in a 100 mm. tube, at 25° C.

When mixed with an equal volume of a concentrated solution of sodium hydroxide it forms a semi-solid mass.

Dissolve 2 drops of the Oil in 4 mils of alcohol, and add a drop of ferric chloride T.S.; a light green color is produced; if the same test is made with a drop of dilute ferric chloride T.S., prepared by diluting the test solution with 4 times its volume of distilled water, a light bluish coloration is produced, which soon disappears.

To 3 drops of the Oil, contained in a small test tube, add 3 drops of sulphuric acid, cork the test tube and allow the mixture to stand for half an hour; a resinous mass is obtained. Add 4 mils of diluted alcohol to this mass, vigorously shake the mixture, and gradually heat on a water bath to the boiling point; the liquid remains nearly colorless, and does not acquire a red or purplish-red color (distinction from *oil of pimenta or oil of clove*).

Shake 1 mil of the Oil with 20 mils of hot distilled water and filter; the filtered aqueous solution does not give more than a scarcely perceptible acid reaction with litmus paper and on adding a drop of ferric chloride T.S. it yields only a transient, grayish-green but not a blue or violet color (*phenol*).

OVI ALBUMEN RECENS

Fresh Egg Albumen

Ovi Album.

The freshly separated liquid white, or albumen, of recently laid eggs of the hen, *Gallus domesticus* Temminck (Fam. *Phasianidæ*).

OVI VITELLUM RECENS

Fresh Egg Yolk

Ovi Vitel.

The freshly separated yolk of recently laid eggs of the hen, *Gallus domesticus* Temminck (Fam. *Phasianidæ*).

OVUM GALLINACEUM

Fresh Egg

Ovum Gallin.

The recently laid egg of the hen, *Gallus domesticus* Temminck (Fam. *Phasianidæ*).

PAPAVERIS FRUCTUS

Poppy Capsules

Papav. Fruct.

The dried, fully grown, unripe fruit of *Papaver somniferum* Linné (Fam. *Papaveraceæ*). Separate and reject the seeds before using the fruit in pharmaceutical preparations.

Globular or ovoid, usually from 3 to 3.5 cm. in diameter, but varying in size, more or less sunken or depressed on the sides, contracted at the base into a sort of neck immediately above a tumid ring at the point of attachment with the stalk; crowned at the summit with the seven- to fifteen-rayed stigma disk; outer wall of pericarp smooth, hard, grayish-yellow to brownish-yellow, often marked with black spots; interior

surface rugose, finely striated transversely, and bearing thin, brittle, membranaceous placentæ which extend from the sutures toward the center, and bear on their faces and edges numerous, minute, conspicuously reticulated, reniform white seeds. Odorless; taste slightly bitter.

Macerate 1 Gm. of the powdered Capsules for two hours with 10 mils of water containing 1 per cent. of hydrochloric acid, and filter; the filtrate yields distinct precipitates with iodine T.S. and with potassio-mercuric iodide T.S.

The powdered drug is grayish-yellow, and, when examined under the microscope, exhibits fragments of the epicarp composed of thick-walled polygonal cells, the cells of the outer layer non-porous, up to 0.05 mm. in diameter and with occasional stomata, the latter up to 0.035 mm. in length; the cells of the inner layer of the epicarp often with numerous simple pores; portions of the soft, spongy sarcocarp consisting of isodiametric or irregular parenchyma and branching milk ducts, the latter up to 0.06 mm. in width, of variable length and with thin, non-porous walls; fragments of the inner wall of the pericarp and the outer wall of the placental tissue composed of polygonal or somewhat elongated cells with porous walls, up to 0.06 mm. in width and up to 0.3 mm. in length, the walls of the latter cells often slightly lignified; spiral and annular tracheæ up to 0.035 mm. in width and reticulate tracheæ up to 0.06 mm. in width; sclerenchyma cells few with simple or oblique pores; starch grains few, small, somewhat rounded; fragments of the reticulately pitted seed-coat very few or absent.

Poppy Capsules yield not more than 10 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

PARACOTO

Paracoto

Paracot.

The dried bark of an unidentified tree indigenous to Northern Bolivia.

In quills, or fragments of quills, of indefinite length, usually from 3 to 6 cm. in breadth, from 5 to 15 mm. in thickness; of a deep-brown color throughout, the outer surface nearly smooth, lightly, transversely fissured, and often very thinly scaly, the inner surface very coarsely striate; hard and heavy, but splitting and breaking readily, the fracture mealy in the outer layer, with an irregular resinous band, coarse splintery in the inner layer, with large, yellowish-brown bast fibers and stone cells and darker resin tissue. Odor strong and characteristic, nutmeg-like; taste strongly aromatic and pungent.

Paracoto yields not more than 3 per cent. of ash.

AVERAGE DOSE—Metric, 0.3 Gm.—Apothecaries, 5 grains.

PAREIRA

Pareira

(U.S.P. VIII)

Pareira Brava

The dried roots of *Chondodendron tomentosum* Ruiz et Pavon (Fam. *Menispermaceæ*), without the presence of more than 5 per cent. of stems or other foreign matter.

Nearly cylindrical, more or less tortuous, of variable length and from 1 to 6 cm. in diameter; externally brownish-black or blackish-brown with transverse ridges on knot-like projections, occasionally fissured and longitudinally wrinkled or even

furrowed; hard, heavy and tough; when freshly cut having a waxy luster; the transverse surfaces exhibiting several successive eccentric and distinctly radiate concentric zones of projecting, secondary fibro-vascular bundles, each from 2 to 4 mm. in width, and separated by distinct concentric zones of parenchyma and stone cells. Stems deeply furrowed, grayish in color, usually covered with foliaceous patches of lichens bearing their blackish apothecia; internally grayish-yellow, with a prominent development of wood with a tendency to separate fibro-vascular bundles and without a waxy luster. Odor slight; taste very bitter.

The powder is dark brown, containing numerous starch grains and a few woody fragments; starch grains mostly simple, occasionally unequally two- to four-compound, the individual grains ellipsoidal or oblong, 0.005 to 0.02 mm. in diameter, and occasionally with central clefts or irregular markings; fragments with large, wide tracheæ, the walls with numerous slit-like pores and associated with long, thick-walled, strongly lignified, porous wood fibers; stone cells in small groups, with thick porous walls and in form resembling those of the fruits and seeds; fragments of starch-bearing parenchyma; the cells of the root being thick-walled, strongly lignified and with large, longitudinal, elliptical pores; occasional fragments of blackish-brown cork.

Pareira yields not more than 5 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

PASSIFLORA

Passion Flower

Passiflor. Passion Vine

The dried herbage of *Passiflora incarnata* Linné (Fam. *Passifloraceæ*), collected after some of the berries have matured.

Stems glabrous or slightly pubescent above, striate, from 6 to 8 mm. in diameter, of variable length, woody, hollow, the cavity about one-half the diameter; bark very thin, greenish or purplish; wood very porous and bordered on the inner side by a thin layer of pith; fracture of the wood uneven, of the stem smooth, of the bark coarsely fibrous. Leaves more or less broken in drying, rather thick, glabrous or often pubescent, when entire nearly orbicular in outline, base cordate, deeply three- to five-lobed, lobes ovate, acute, finely serrate, petioles from 1 to 5 cm. in length, with two glands near the summit. Tendrils numerous and closely coiled. Flowers solitary, axillary, peduncles as long as the petioles, usually three bracted; calyx cup-shaped, four to five lobes; lobes linear, imbricated, cuspidate, corona of the fresh flowers purplish; petals four to five, yellow; ovary oblong, stalked; stamens monadelphous in a tube about the stalk of the ovary, separated above, anthers narrow, versatile. Fruit from 4 to 5 cm. in length, an ovoid, many-seeded berry; externally green or yellow, shriveled and wrinkled; seeds flat, ovate, yellowish to brown arilled. Taste and odor slight.

Passion Flowers yield not more than 12 per cent. of ash.

AVERAGE DOSE—Metric, 0.2 Gm.—Apothecaries, 3 grains.

PERSIO

Cudbear

A purplish-red powder prepared from species of *Roccella* De Candolle, *Lecanora* Acharius, or other lichens.

An aqueous or alcoholic preparation of Cudbear is of a deep red color which is rendered lighter in tint by the addition of acids and changed to purplish-red on the addition of alkalies.

Agitate 2 Gm. of Cudbear occasionally with 200 mils of water during thirty minutes and then filter; the deep red-colored filtrate conforms to the following tests: Add to 5 mils of the filtrate 5 drops of glacial acetic acid and boil for one minute; then add 5 drops of stannous chloride T.S., and boil again for one minute; the liquid is only faintly pink (*brazilwood or logwood* which produce solutions of a deep red color); add 25 Gm. of kaolin to 100 mils of the filtrate in an Erlenmeyer flask, shake frequently during one hour and then filter; the filtrate is almost entirely decolorized in comparison with some of the original filtrate (*a number of coal tar colors*).

Cudbear yields not more than 35 per cent. of ash, consisting mainly of sodium chloride.

PETROSELINI RADIX

Parsley Root

Petrosel. Rad.

The dried root of *Petroselinum sativum* Hoffmann (Fam. *Umbelliferæ*).

The entire fusiform root, measuring up to 20 cm. in length and up to 2.5 cm. in thickness at the crown, or broken or cut into pieces; usually cut lengthwise into two or four sections; externally light yellowish, wrinkled longitudinally, somewhat annulate, root scars distinct and corky; fracture tough when damp, brittle when dry; internally, cortex whitish and characterized by numerous, reddish-brown oleoresin cells, cambium zone distinct and brownish; wood about the same thickness as the cortex, slightly radiate and light yellow. Odor aromatic; taste sweetish and pungent.

The powdered drug, when examined under the microscope, shows numerous truncate or somewhat angular starch grains up to 0.03 mm. in diameter, reticulate tracheæ up to 0.06 mm. in width and thin-walled, lignified fibers with simple pores.

Parsley Root yields not more than 6 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

PHYTOLACCA

Phytolacca

(U.S.P. VIII)

Phytolac. Poke Root

The dried root of *Phytolacca decandra* Linné (Fam. *Phytolaccaceæ*), collected in the autumn.

Cylindrical, somewhat tapering, sparingly branched, from 3 to 7 cm. in thickness, mostly in transverse or longitudinal slices; externally yellowish-brown, finely longitudinally or spirally wrinkled and thickly annulate with lighter colored, low ridges; fracture fibrous, characterized by alternating layers of fibro-vascular tissue and parenchyma, the layers of the latter being much retracted. Odor slight; taste sweetish, afterwards highly acrid.

Phytolacca yields not more than 14 per cent. of ash.

	Metric	Apothecaries
AVERAGE DOSE—Emetic,	1 Gm.	15 grains.
Alterative,	0.1 Gm.	1½ grains.

PIMENTA

Pimenta

(U.S.P. VIII)

Piment. Allspice

The dried, nearly ripe fruit of *Pimenta officinalis* Lindley (Fam. *Myrtaceæ*), without the presence of more than 5 per cent. of stems or other foreign matter.

Sub-globular, from 4 to 7 mm. in diameter, summits with four calyx teeth forming a minute ring; externally dark brown, somewhat rough and glandular-punctate; pericarp brittle, about 1 mm. in thickness; two-celled and two-seeded; dissepiments thin; seeds plano-convex, slightly reniform, externally reddish-brown, smooth, somewhat wrinkled and shiny. Odor and taste, particularly of the pericarp, aromatic and distinctive.

The powder is reddish-brown or dark brown and, when examined under the microscope, shows irregular fragments and numerous starch grains, the latter being either simple or compound, the individual grains spherical, from 0.003 to 0.015 mm. in diameter, plano-convex or polygonal, and frequently with a central circular marking or cleft; stone cells numerous, of tabular, pyriform or variable shape and with thick, porous, and strongly lignified walls, the lumina frequently filled with a yellowish- or reddish-brown amorphous substance, fragments with oil secretion reservoirs containing globules of a yellowish-brown oil; parenchyma cells with reddish-brown tannin masses. Stem fragments very few, and characterized by more or less curved, thick-walled, non-glandular hairs, rosette aggregates of calcium oxalate, from 0.006 to 0.017 mm. in diameter, tracheid-like tissues of the wood and long narrow bast fibers.

The yield of crude fiber does not exceed 25 per cent. when estimated as directed in the U. S. Pharmacopœia (see page 359).

Pimenta yields not more than 6 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

PIMPINELLA

Pimpinella

Pimpinell. Pimpernel Root

The dried rhizome and roots of *Pimpinella Saxifraga* Linné, or *Pimpinella magna* Linné (Fam. *Umbelliferæ*).

Cylindrical or slightly tapering, from 10 to 20 cm. in length and from 1 to 1.5 cm. in diameter at the crown, frequently branching, sometimes split longitudinally or broken into pieces; the upper or rhizome portion annulate, with undeveloped stem buds and a few attached stem remains which should not be over 5 cm. in length; roots longitudinally wrinkled, slightly annulate, cortex thin, easily detached; fracture short when dry, tough and flexuous when damp; externally light yellowish-brown; internally porous; cortex broad and whitish with numerous groups of projecting radial bast fibers and reddish-brown oleoresin cells; wood yellowish, usually with a few indistinct fibers, medullary rays interrupted, cambium zone distinct. Odor aromatic; taste sweetish, pungent and acrid.

The powdered drug, when examined under the microscope, shows numerous simple or two- to four-compound starch grains, the individual grains being from 0.004 to 0.01 mm. in diameter; secretion canals from 0.05 to 0.06 mm. in diameter; tracheæ reticulate or scalariform, from 0.035 to 0.07 mm. in breadth; fibers, thin-walled numerous, thick-walled with simple pores few (*P. magna*).

Pimpinella yields not more than 5 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

PINUS ALBA

White Pine Bark

Pinus Alb.

The dried inner bark of *Pinus Strobus* Linné (Fam. *Pinaceæ*).

In flat pieces of variable size and from 1 to 3 mm. in thickness; outer surface varying from a pale pinkish-white when fresh, to a light or rather deep yellowish-brown on keeping, occasionally with small patches of the gray-brown periderm adhering; more or less cottony, and often showing small scattered pits; inner surface either lighter or darker than the outer, finely striate; fracture tough, fibrous; transverse section showing an outer yellowish and an inner whitish band. Odor slight, terebinthinate; taste slightly mucilaginous, bitter, sweet and astringent.

The powdered drug, when examined under the microscope, exhibits numerous rounded or oval, simple starch grains, up to 0.03 mm. in diameter, some having a cleft or fissure through the center; few monoclinic prisms of calcium oxalate about 0.02 mm. in diameter; resin in reddish-brown, angular masses; thin-walled parenchyma cells, isodiametric to elongated, many containing starch grains; tracheids very few or absent.

White Pine Bark yields not more than 3 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

PIX LITHANTHRACIS

Coal Tar

Pix Lith. Pix Carbonis

The tar obtained as a by-product in the destructive distillation of coal in the manufacture of illuminating gas.

A nearly black, thick liquid or semi-solid, heavier than water and possessing a characteristic, naphthalene-like odor and a sharp burning taste.

It is only slightly soluble in water, to which it imparts its characteristic odor and taste and a faintly alkaline reaction. It is but partially dissolved by alcohol, acetone, methyl alcohol, or purified petroleum benzin; almost entirely dissolved by ether; entirely dissolved by benzene, carbon disulphide, or chloroform.

On ignition it burns with a reddish, luminous and very sooty flame and upon strong heating is almost entirely consumed, leaving not more than 2 per cent. of ash.

PLUMBI CARBONAS

Lead Carbonate

Plumb. Carb. White Lead

A mixture of lead carbonate and hydroxide [approximately $(PbCO_3)_2 Pb(OH)_2 = 775.32$].

Lead Carbonate occurs as a heavy, white, opaque powder, or as a pulverulent mass, without odor or taste; permanent in the air.

Insoluble in water or alcohol, but dissolved by acetic acid or diluted nitric acid, with effervescence.

When strongly heated it turns yellow without charring, and when heated in contact with charcoal it is reduced to metallic lead.

Dissolve 2 Gm. of Lead Carbonate in a mixture of 2.5 mils of nitric acid and 40 mils of distilled water; not more than 0.01 Gm. of residue remains. Separate portions of this solution yield a black precipitate with hydrogen sulphide T.S.; a yellow precipitate with potassium iodide T.S.; and a white precipitate with diluted sulphuric acid. On completely precipitating 10 mils of this solution with hydrogen sulphide, the filtrate, on evaporation, leaves not more than 0.01 Gm. of residue.

Ignite 1 Gm. of Lead Carbonate in a porcelain crucible; it leaves a residue of lead oxide weighing not less than 0.83 Gm.

PLUMBI IODIDUM

Lead Iodide

(U.S.P. VIII)

Plumb. Iod.

It contains not less than 99 per cent. of PbI_2 (460.94). Preserve it in well-closed containers, protected from light.

Lead Iodide occurs as a heavy, bright yellow powder, without odor or taste; permanent in the air.

One gramme dissolves in about 1300 mils of water at 25° C. and in about 200 mils of boiling water, separating from the latter solution on cooling in brilliant, golden-yellow crystalline laminæ; very slightly soluble in alcohol; soluble, without color, in solutions of the fixed alkalies, in concentrated solutions of the alkali acetates, of potassium iodide, and of sodium thiosulphate, and in a hot solution of ammonium chloride.

When moderately heated, the salt fuses to a thick, reddish-brown liquid, which congeals, on cooling, to a yellow, crystalline mass. At a higher temperature it is decomposed, with the evolution of violet vapors of iodine, leaving a lemon-yellow residue of lead oxyiodide.

Triturate 1 Gm. of the salt with 2 Gm. of ammonium chloride and 2 mils of distilled water; a nearly white mixture results. Transfer this to a test tube, and heat in a water bath for a few minutes; a clear, almost colorless solution is formed (*chromate and other insoluble foreign salts*). On cooling this solution, a solid mass of nearly colorless, fine, silky crystals is produced, and on adding water or diluted sulphuric acid to this mass, yellow Lead Iodide separates.

Add 0.1 Gm. of the salt to 5 mils of distilled water, and heat the mixture until it boils; cool the liquid and filter it into a test tube of about 40 mils capacity, then add 5 mils of sodium hydroxide T.S. and about 0.2 Gm. of aluminum wire; insert in the upper portion of the test tube a pledget of purified cotton, and over the mouth place a piece of moistened red litmus paper and then heat the tube on a water bath during fifteen minutes; no blue coloration of the paper will be discernible (*nitrate*).

Boil 1.5 Gm. of Lead Iodide for a few minutes with 15 mils of distilled water, cool and filter. To 5 mils of the filtrate add a slight excess of silver nitrate T.S., then a slight excess of hydrochloric acid and filter. Neutralize the filtrate with ammonia water and add a drop of ferric chloride T.S. No red color is produced (*acetate*).

To another 5 mil portion of the filtrate add an excess of hydrogen sulphide T.S., filter, evaporate to dryness and ignite; not more than 0.002 Gm. of residue remains.

PLUMBI OXIDUM RUBRUM

Red Oxide of Lead

Plumb. Oxid. Rub. Red Lead

Lead orthoplumbate [$Pb_2PbO_4 = 685.3$] usually with some unconverted lead monoxide [PbO], corresponding to not less than 31 per cent. of lead dioxide (PbO_2).

Red Oxide of Lead occurs as a heavy, orange-red powder without odor or taste. On exposure to the air it slowly absorbs moisture and carbon dioxide.

Almost insoluble in water, insoluble in alcohol, but dissolved by an excess of glacial acetic acid; also dissolved by lactic acid with the evolution of carbon dioxide and the odor of acetaldehyde.

When heated in a porcelain crucible, Red Oxide of Lead at first changes color from red to a violet and then to a blackish tint, and regains its original color on cooling, but, when the heating is continued, it slowly decomposes, forming lead monoxide and oxygen. When heated in contact with charcoal, it is reduced to metallic lead.

Treat 5 Gm. of Red Oxide of Lead with 50 mils of diluted nitric acid; little effervescence results (*carbonate*), and a brown, insoluble residue of lead dioxide (PbO_2) remains, which, upon the addition of solution of hydrogen dioxide, dissolves with the evolution of oxygen, forming a colorless solution. Boil this solution for fifteen minutes, cool, and filter; the undissolved residue weighs not more than 0.2 Gm. (*silicate or lead sulphate*).

Separate portions of the solution obtained in the last test yield with hydrogen sulphide T.S., a black precipitate; with potassium iodide T.S., a yellow precipitate; and with diluted sulphuric acid, a white precipitate; the latter two precipitates being soluble in a solution of sodium hydroxide (1 in 4).

From a solution of 0.5 Gm. of Red Oxide of Lead in diluted nitric acid, obtained by the aid of solution of hydrogen dioxide, precipitate the lead with sulphuric acid and filter the mixture. After the addition of an excess of ammonia water this filtrate does not develop more than a slight, bluish tint (*copper*), nor yield more than traces of a reddish-brown precipitate (*iron*).

Heat a mixture of 1 Gm. of Red Oxide of Lead with 50 mils of distilled water to boiling, cool, and filter. The filtrate is colorless, is not more than faintly alkaline to litmus, and, when evaporated to dryness, leaves not more than 0.01 Gm. of residue (*soluble impurities*).

Assay.—Add about 1 Gm. of Red Oxide of Lead, accurately weighed, to a cool solution of 40 Gm. of crystallized sodium acetate and 2 Gm. of potassium iodide in 50 mils of 50 per cent. acetic acid, agitate the mixture until all of the Red Oxide of Lead has dissolved and then titrate the solution with tenth-normal sodium thiosulphate V.S. It shows not less than 31 per cent. of lead dioxide (PbO_2).

Each mil of tenth-normal sodium thiosulphate V.S. corresponds to 0.01195 Gm. of lead dioxide (PbO_2). Each gramme of Red Oxide of Lead corresponds to not less than 25.9 mils of tenth-normal sodium thiosulphate V.S.

POPULI GEMMÆ

Balsam Poplar Buds

Pop. Gem. Balm of Gilead Buds

The air-dried, closed winter leaf-buds of *Populus nigra* Linné or *Populus balsamifera* Linné (Fam. *Salicaceæ*), collected early in the spring. Preserve the buds in tightly-closed containers of glass or tin.

Conical, pointed, up to 2 cm. in length and from 2 to 5 mm. in thickness, consisting of closely imbricated scales, externally brown and glossy, glutinous with fragrant resin. Odor pleasant, balsamic; taste aromatic and bitter.

POTASSII CHLORIDUM

Potassium Chloride

Pot. Chlorid.

It contains, when dried to constant weight at 100° C., not less than 99 per cent. of KCl (74.56). Preserve it in well-closed containers.

Potassium Chloride occurs in colorless, elongated, prismatic, or cubical crystals, or as a white, granular powder; permanent in dry air. Odorless; taste saline.

One gramme dissolves in 2.8 mils of water at 25° C., slightly more soluble in boiling water; insoluble in alcohol.

An aqueous solution of the salt (1 in 10) is clear and neutral to litmus.

When heated, the dry salt decrepitates. To a non-luminous flame it imparts a violet color unmasked by yellow.

An aqueous solution of the salt yields with silver nitrate T.S. a white, curdy precipitate insoluble in nitric acid but soluble in an excess of ammonia water.

Boil 5 mils of an aqueous solution of the salt (1 in 10) in a test tube, then add an equal volume of barium hydroxide T.S. and stopper the tube; the solution is not rendered cloudy within fifteen minutes (*calcium or magnesium*).

Dissolve 2 Gm. of the salt in 6 mils of distilled water, add 1 mil of chloroform, and then add, drop by drop, with constant agitation, 5 mils of half-strength chlorine water; the chloroform does not acquire a transient violet or permanent orange color (*iodide or bromide*).

An aqueous solution of the salt meets the requirements of the Test for arsenic (see page 356).

An aqueous solution of the salt does not respond to the Test for heavy metals (see page 357).

Assay.—Dissolve about 0.25 Gm. of Potassium Chloride, previously dried to constant weight at 100° C. and accurately weighed, in 25 mils of distilled water in a 200 mil measuring flask. Add 50 mils of tenth-normal silver nitrate V.S. to the solution, then 5 mils of nitric acid, afterward sufficient distilled water to make 200 mils and mix thoroughly. Filter the mixture through a dry filter, reject the first 20 mils of the filtrate, collect the following 100 mils of filtrate, add to this 2 mils of ferric ammonium sulphate T.S. and titrate with tenth-normal potassium sulphocyanate V.S., until the supernatant liquid remains reddish after it is well shaken. It shows, in the dried salt, not less than 99 per cent. of Potassium Chloride.

Each mil of tenth-normal silver nitrate V.S. corresponds to 0.007456 Gm. of KCl. Each gramme of Potassium Chloride, dried to constant weight, corresponds to not less than 132.8 mils of tenth-normal silver nitrate V.S.

POTASSII SULPHAS

Potassium Sulphate

(U.S.P. VIII)

Pot. Sulph.

It contains, when dried to constant weight at 100° C., not less than 99 per cent. of K_2SO_4 (174.27).

Potassium Sulphate occurs as hard, colorless, translucent, six-sided, rhombic prisms terminated by pyramids, or as a white powder; permanent in the air. Odorless; taste saline, somewhat bitter.

One gramme dissolves in 10 mils of water at 25° C., and in 4 mils of boiling water; insoluble in alcohol.

When heated the crystals decrepitate. At a bright red heat the salt fuses, and at a white heat partial decomposition occurs.

An aqueous solution of the salt (1 in 20) is neutral to litmus.

A saturated aqueous solution of the salt yields a white, crystalline precipitate with an excess of sodium bitartrate T.S.

An aqueous solution of the salt (1 in 20) yields with barium chloride T.S. a heavy white precipitate, insoluble in hydrochloric acid.

An aqueous solution of Potassium Sulphate does not respond to the Test for heavy metals (see page 357).

An aqueous solution of the salt meets the requirement of the Test for arsenic (see page 356).

Assay.—Dissolve about 0.6 Gm. of Potassium Sulphate, previously dried to constant weight at 100° C. and accurately weighed, in 100 mils of distilled water, acidulate the solution with hydrochloric acid and heat it to boiling. Gradually add an excess of barium chloride T.S., and heat for thirty minutes on a water bath: collect the precipitate of barium sulphate on a filter and wash it with distilled water until silver nitrate T.S. fails to produce an opalescence in 2 mils of the filtrate, previously acidulated with nitric acid. Dry the precipitate, ignite and weigh the residue. It corresponds to not less than 99 per cent. of K_2SO_4.

Each gramme of Potassium Sulphate corresponds to not less than 1.326 Gm. of $BaSO_4$.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

PRUNUM

Prune

(U.S.P. VIII)

The partly dried, ripe fruit of *Prunus domestica* Linné (Fam. *Rosaceæ*).

Oblong, ellipsoidal, more or less compressed, from 3 to 4 cm. in length; externally brownish-black, shriveled; the sarcocarp sweet and acidulous; putamen hard, smooth or irregularly ridged; seed, shaped like that of the almond but smaller, and of a bitter-almond taste.

PULSATILLA

Pulsatilla

Pulsatil. Pasque Flower

The dried herb of *Anemone Pulsatilla* Linné, *Anemone pratensis* Linné, or of *Anemone Ludoviciana* (Nuttall) Heller (Fam. *Ranunculaceæ*), without the presence of more than 5 per cent. of foreign matter.

Leaves and flowering scapes matted, silky-villous; basal leaves with petioles up to 30 cm. in length, the latter hollow, often purplish in color, the blades twice or thrice deeply three- or four-parted or pinnately cleft, the lobes linear and acute, the base of the petiole more hairy than above and frequently attached to the short rootstock; flowering scapes up to 30 cm. in length, solid in the lower portion and hollow in the upper part, with sessile, involucral dissected leaves near the flower, occasionally with remains of the dull purple hairy sepals and the dense-woolly, plumose-tailed akenes. Nearly odorless; taste very acrid.

The powder, when examined under the microscope, shows numerous simple, thick-walled hairs up to 2.5 mm. in length and up to 0.02 mm. in thickness; tracheæ up to 0.03 mm. in breadth with spiral markings or with simple or bordered pores; fragments of epidermal tissue with stomata, the latter being broadly elliptical and up to 0.05 mm. in length; some epidermal cells with wavy vertical walls; calcium oxalate crystals and starch grains few or absent.

Pulsatilla yields not more than 10 per cent. of ash.

AVERAGE DOSE—Metric, 0.3 Gm.—Apothecaries, 5 grains.

PUMEX

Pumice

A substance of volcanic origin, consisting chiefly of complex silicates of aluminum, potassium, and sodium.

Pumice occurs as very light, hard, rough, porous gray masses, or as a gritty, gray-colored powder. It is permanent in the air, odorless and tasteless. The dry masses usually float on water.

Boil 10 Gm. of Pumice with 50 mils of distilled water for one-half hour, adding distilled water from time to time to maintain approximately the original volume and then filter; the filtrate is neutral to litmus, and one-half of this filtrate, when evaporated and the residue dried to constant weight at 110° C., yields not more than 0.01 Gm. of residue (*soluble substances*). The remaining half of the filtrate, after slightly acidulating with hydrochloric acid, does not yield a blue color with potassium ferrocyanide T.S. (*iron*).

Boil 1 Gm. of Pumice with 25 mils of diluted hydrochloric acid for one-half hour, adding distilled water from time to time to maintain approximately the original volume, and then filter the liquid; the filtrate yields upon evaporating to dryness, igniting and quickly weighing, not more than 0.05 Gm. of residue.

QUERCUS

Quercus

(U.S.P. VIII)

Querc. White Oak Bark

The dried bark of the trunk and branches of *Quercus alba* Linné (Fam. *Fagaceæ*), deprived of the periderm.

In nearly flat pieces, from 2 to 10 mm. in thickness; externally light brown, becoming darker with age, rough-fibrous; fracture uneven, coarsely fibrous. Odor distinct; taste strongly astringent; not tinging the saliva yellow when chewed.

Quercus yields not more than 7 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

QUILLAJA

Quillaja

(U.S.P. VIII)

Soap-tree Bark

The dried bark of *Quillaja Saponaria* Molina (Fam. *Rosaceæ*), deprived of the periderm.

In flat pieces of variable length, from 3 to 8 mm. in thickness, or in small chips; outer surface brownish-white, often with small patches of cork attached, otherwise nearly smooth; inner surface yellowish-white, nearly smooth, with occasional circular depressions, conical projections of transverse channels; fracture uneven and strongly fibrous, the laminæ oblique to each other. Odor slight; taste acrid.

The powder is strongly sternutatory, and contains calcium oxalate in monoclinic pyramids and prisms from 0.035 to 0.2 mm. in length.

Quillaja yields not more than 10 per cent. of ash.

QUININA

Quinidine

Quinid.

An alkaloid [$C_{20}H_{24}O_2N_2 = 324.21$], isomeric with quinine, obtained from the bark of various species of *Cinchona* (Fam. *Rubiaceæ*). Preserve it in well-closed containers, protected from light.

Quinidine occurs in acicular white crystals or as an amorphous white powder. When crystallized from alcohol it forms monoclinic prisms containing one molecule of alcohol which it slowly loses on exposure to air, and rapidly loses when heated to 100° C. When precipitated by ammonia water from an aqueous solution of a salt of Quinidine, washed and dried, it forms an amorphous powder. Odorless and having an intense and persistent bitter taste.

When crystallized from an alcoholic solution, one gramme dissolves at 25° C. in about 32 mils of alcohol, 53 mils of ether, and 1.5 mils of chloroform; very slightly soluble in petroleum benzin and almost insoluble in water.

One gramme of dried amorphous Quinidine dissolves at 25° C. in about 36 mils of alcohol, 67 mils of ether, and 1.7 mils of chloroform; very slightly soluble in petroleum benzin and almost insoluble in water.

Quinidine melts at about 168° C. Incinerate 0.2 Gm. of Quinidine; no weighable residue remains.

Its alcoholic solution is dextrorotatory and its aqueous solution is alkaline to litmus.

A solution of Quinidine in diluted sulphuric acid (1 in 1000) shows a strong blue fluorescence.

Add a few drops of bromine T.S. to 10 mils of an aqueous solution of Quinidine (1 in 1000), made with the aid of sufficient diluted sulphuric acid to produce complete solution, and then follow with ammonia water in slight excess; the liquid acquires an emerald-green color.

A solution of about 0.1 Gm. of Quinidine in 5 mils of sulphuric acid is not darker than pale yellow.

Dissolve 0.5 Gm. of Quinidine in 10 mils of distilled water at 80° C., with just enough sulphuric acid to form a solution neutral to litmus paper, and add a neutral solution of 0.5 Gm. of potassium iodide in 5 mils of distilled water at 80° C. Agitate the mixture slightly, cool it to 15° C. and keep it at this temperature for one hour with occasional stirring. A white precipitate is formed (difference from *quinine*). Filter out the precipitate and add 2 drops of ammonia water to the filtrate; it does not cause more than a slight turbidity (*other cinchona bases*). Care must be taken to have the liquid perfectly neutral after the addition of the potassium iodide solution; if slightly acid, very dilute ammonia water must be added, drop by drop, with constant stirring until exactly neutral to litmus paper.

	Metric	Apothecaries
AVERAGE DOSE—Tonic,	0.1 Gm.—	1½ grains.
Anti-malarial,	1 Gm.—15	grains, daily.

QUININÆ GLYCEROPHOSPHAS

Quinine Glycerophosphate

Quin. Glycerophos. Quinine Glycerinophosphate

The glycerophosphate [$(C_{20}H_{24}O_2N_2)_2PO_4H_2(C_3H_7O_2) + 4H_2O = 892.60$] of the alkaloid quinine. Preserve it in well-stoppered, amber-colored bottles.

Quinine Glycerophosphate occurs as fine, white crystalline needles or as a powder; odorless and having a very bitter taste.

One gramme dissolves in about 850 mils of water, or 75 mils of alcohol at 25° C.; very soluble in boiling alcohol; very slightly soluble in chloroform or ether; soluble in 20 parts of a mixture of one volume of alcohol and two volumes of chloroform.

Quinine Glycerophosphate slowly loses part of its water of crystallization at room temperature and when heated to 100° C. becomes anhydrous. Incinerate 0.2 Gm. of the salt; no weighable residue remains.

The salt yields a clear solution with diluted sulphuric acid. An aqueous solution is not fluorescent, but becomes so upon the addition of a few drops of diluted sulphuric acid.

Add 1 mil of bromine T.S. to 10 mils of a saturated aqueous solution of the salt, and then follow with 1 mil of ammonia water; the liquid acquires an emerald-green color.

When the salt is heated with potassium bisulphate the odor of acrolein is given off.

An aqueous solution of 0.1 Gm. of the salt in 10 mils of distilled water, made with the aid of acetic acid, does not produce a precipitate on the addition of ammonium oxalate T.S. (*calcium*).

Dissolve 0.1 Gm. of the salt in 10 mils of diluted hydrochloric acid; the solution does not become more than faintly turbid upon the addition of a few drops of barium chloride T.S. (*sulphate*).

Dissolve 0.1 Gm. of the salt in 10 mils of diluted nitric acid; the solution is not rendered more than faintly turbid on the addition of silver nitrate T.S. (*chloride*).

Add a slight excess of ammonia water to a saturated aqueous solution of the salt, and filter; the clear filtrate does not show more than a slight turbidity with magnesia mixture T.S. (*phosphate*).

Mix about 2.5 Gm. of the salt in a separatory funnel with 15 mils of distilled water, add 5 mils of ammonia water, shake with three successive portions of 25, 15 and 10 mils of chloroform, respectively, and evaporate the chloroform solutions to dryness on a water bath. Dissolve 1.5 Gm. of this dry residue in 25 mils of alcohol, add 50 mils of hot distilled water, neutralize the liquid with normal sulphuric acid V.S., using methyl red T.S. as indicator and evaporate the liquid to dryness on a water bath. Powder the residue, mix it with 20 mils of distilled water and maintain the temperature of the mixture at 65° C., for thirty minutes, agitating frequently. Now cool the mixture to 15° C., macerate it at this temperature for two hours with occasional shaking, then filter it through a dry filter, of from 8 to 10 cm. in diameter, into a dry test tube. Transfer 5 mils of this filtrate to a test tube and mix it gently (without shaking) with 7 mils of ammonia water, which must contain not less than 10 per cent. nor more than 10.2 per cent. of NH_3, must have a temperature of 15° C. and be added at once. A clear liquid is produced (*other cinchona alkaloids*).

If the temperature during the maceration has been 16° C., add 7.5 mils of ammonia; if 17° C., add 8 mils.

	Metric	Apothecaries
AVERAGE DOSE—Tonic,	0.1 Gm.—	1½ grains.
Anti-malarial,	1 Gm.—	15 grains, daily.

QUININÆ HYPOPHOSPHIS

Quinine Hypophosphite

Quin. Hypophos.

The hypophosphite [$C_{20}H_{24}O_2N_2HPH_2O_2 + 2H_2O = 426.31$] of the alkaloid quinine. Preserve it in well-stoppered, amber-colored bottles.

Quinine Hypophosphite occurs as fine, white, silky, glistening needles or prisms; odorless and having a very bitter taste.

One gramme dissolves in about 35 mils of water, in 12.5 mils of alcohol, or in 27 mils of chloroform at 25° C.; almost insoluble in ether.

Heated to 100° C., Quinine Hypophosphite becomes anhydrous; the anhydrous salt melts at about 181° C. At a higher heat it fuses to a black mass and evolves vapors of phosphuretted hydrogen. Incinerate 0.2 Gm. of the salt; no weighable residue remains.

Add 1 mil of bromine T.S. to 10 mils of an aqueous solution of the salt (1 in 1000) and then follow with 1 mil of ammonia water; the liquid acquires an emerald-green color.

Acidulate an aqueous solution of the salt (1 in 40) with a few drops of nitric acid, add silver nitrate T.S. and warm the liquid; a brown precipitate is formed, which, on standing, becomes black.

Dissolve 0.1 Gm. of the salt in 10 mils of distilled water, and add a few drops of nitric acid; the solution is not rendered more than faintly turbid by the addition of silver nitrate T.S. (*chloride*).

Dissolve 0.1 Gm. of the salt in 10 mils of distilled water, and add a few drops of hydrochloric acid; the solution is not rendered more than faintly turbid by the addition of barium chloride T.S. (*sulphate*).

To test this salt for excessive amounts of *other cinchona alkaloids* proceed as directed under *Quininæ Glycerophosphas*.

	Metric	Apothecaries
AVERAGE DOSE—Tonic,	0.1 Gm.—	1½ grains.
Anti-malarial,	1 Gm.—	15 grains, daily.

QUININÆ VALERAS

Quinine Valerate

Quin. Valer.

The valerate [$C_{20}H_{24}O_2N_2HC_5H_9O_2 + H_2O = 443.30$] of the alkaloid quinine. Preserve it in well-stoppered, amber-colored bottles.

Quinine Valerate occurs as white, lustrous crystals, having an odor of valeric acid and an intensely bitter taste.

It is sparingly soluble in cold water, soluble in hot water, becoming less soluble by age on account of loss of valeric acid; readily soluble in alcohol.

Its aqueous solution is neutral or slightly alkaline to litmus.

Add a few drops of bromine water to 10 mils of an aqueous solution of the salt (1 in 1000), then add an excess of ammonia water; an emerald-green color is produced.

An aqueous solution of the salt, acidulated with sulphuric acid, exhibits a blue fluorescence and has the odor of valeric acid.

Incinerate 1 Gm. of Quinine Valerate; not more than 0.1 per cent. of ash remains.

About 0.1 Gm. of the salt dissolves in 5 mils of sulphuric acid without producing more than a light yellow color (*readily carbonizable impurities*).

Ten mil portions of the cold, saturated aqueous solution of the salt do not give more than a slight turbidity with barium chloride T.S. when acidulated with hydrochloric acid (*sulphate*); nor with silver nitrate T.S. when acidulated with nitric acid (*chloride*).

To test this salt for excessive amounts of *other cinchona alkaloids* proceed as directed under *Quininæ Glycerophosphas*.

	Metric	Apothecaries
AVERAGE DOSE—Tonic,	0.1 Gm.—	1½ grains.
Anti-malarial,	1 Gm.—	15 grains, daily.

RENNINUM

Rennin

The partially purified milk-curdling enzyme obtained from the glandular layer of the stomach of the calf, *Bos taurus* Linné (Fam. *Bovidæ*), and capable of coagulating not less than 25,000 times its weight of fresh milk. Rennin of a higher coagulating power may be brought to the standard by admixture with sodium chloride and sugar of milk. Rennin deteriorates rapidly and must be kept in well-stoppered, amber-colored bottles, and stored in a cool place.

Rennin occurs as a grayish-white or yellowish-white powder, or as pale yellow grains or scales having a characteristic and slightly saline taste and a peculiar, not unpleasant odor. It is slightly hygroscopic.

It is slowly soluble in water and in diluted alcohol, the solutions being more or less opalescent.

When mounted in water or diluted alcohol and examined microscopically, it shows no cellular structure, and no blue coloration is produced on the addition of iodine T.S.

Assay.—Mix 0.1 Gm. of Rennin with 50 mils of distilled water by stirring (vigorous shaking or violent agitation of this liquid must be avoided) and allow the liquid to stand for exactly fifteen minutes. Place 50 mils of cow's milk in a beaker about 12 cm. in height and 5 cm. in width, warm rapidly on a water bath to 43° C., add 1 mil of the Rennin solution and stir the mixture slowly for ten seconds. Maintain the temperature of the bath at 43° C. for ten minutes after the addition of the Rennin solution, remove the beaker from the bath and tip it to an angle of 45 degrees. The milk must have lost its fluidity to the extent of exhibiting a decidedly convex surface. An additional thirty seconds on the water bath produces a firm curd.

RHAMNUS CATHARTICA

Rhamnus Cathartica

Rhamn. Cath. Buckthorn Berries Baccæ Spinæ Cervinæ

The dried, ripe fruit of *Rhamnus cathartica* Linné (Fam. *Rhamnaceæ*), without the presence of more than 5 per cent. of the unripe fruit or other foreign matter.

Flattened, globoid or ovoid, from 4 to 8 mm. in diameter; externally purplish-black, wrinkled from shrinking of the mesocarp in drying; three- to four-celled, each cell containing a brown, triangular-convex, seed-like nutlet; in the fully dried, ripe fruit the pedicel is usually lacking. Odor faint, unpleasant; taste at first sweetish, then nauseating and bitter; it colors the saliva purplish-red.

When macerated in water the drupe readily assumes its original globular shape, about 1 cm. in diameter. The expressed pulp is colored red by acids and greenish-yellow by alkalies.

Shake out an aqueous infusion of Rhamnus Cathartica with ether, separate the ethereal solution and shake it with 5 per cent. ammonia water; the ammonia solution assumes a cherry-red color.

The unripe fruit, which is to be rejected, is green to greenish-brown, firm, furrowed, pedicel usually attached; very bitter; it colors the saliva greenish-yellow.

Rhamnus Cathartica yields not more than 5 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

RHUS GLABRA

Rhus Glabra

(U.S.P. VIII)

Rhus Glab. Sumac Berries

The dried, ripe fruit of *Rhus glabra* Linné (Fam. *Anacardiaceæ*), without the presence of more than 5 per cent. of stems or other foreign matter.

Nearly globular, ovoid, more or less reniform, somewhat compressed, about 5 mm. in length and 2 mm. in diameter; externally dark red, velvety with short hairs, summit with remains of the short style, base occasionally with the five-cleft calyx and a short pedicel; endocarp, smooth, shiny, light red; one-celled, one-seeded; seeds dark brown, smooth. Inodorous; taste acidulous and slightly astringent.

The powder is brownish-red, and, when examined under the microscope, exhibits irregular fragments; non-glandular hairs, more or less elliptical or ovoid or spatulate, about 0.15 mm. in length and from 0.045 to 0.08 mm. in width, filled with a pink or red cell sap in which occasionally occur rod-shaped crystals; glandular hairs with a short one-celled stalk and multicellular head, from 0.045 to 0.075 mm. in length; fragments of endosperm numerous; fragments of endocarp showing very small stone cells with irregularly thickened walls, readily determined by the use of aniline sulphate T.S. and sulphuric acid; fragments of embryo with rather small cells containing a fixed oil; occasional reddish colored fragments of epidermis and underlying spiral tracheæ of the mesocarp.

Mix 1 Gm. of powdered Rhus Glabra with 10 mils of hot water, shake the mixture occasionally until cold, filter, and allow the filtrate to evaporate spontaneously in a watch crystal; numerous, feather-shaped crystals separate which polarize light strongly with a distinct play of colors.

Rhus Glabra yields not more than 4 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

RUBI FRUCTUS

Blackberries

The fresh, ripe fruit of varieties of *Rubus nigrobaccus* Bailey or *Rubus villosus* Aiton (Fam. *Rosaceæ*).

An aggregate fruit, ovate to oblong, rounded or slightly pointed, composed of numerous, shining black drupelets attached to an esculent receptacle; pericarp externally smooth or with only a few hairs (*R. villosus*), mesocarps fleshy, juice purple-red, endocarps hard, black, surfaces deeply wrinkled.

RUBI IDÆI FRUCTUS

Raspberries

The fresh, ripe fruit of varieties of *Rubus Idæus* Linné or of *Rubus strigosus* Michaux (Fam. *Rosaceæ*).

An aggregate fruit, globular or hemispherical with a concave depression at the base where separated from the receptacle, composed of twenty or more small, rounded-polygonal, succulent drupelets; pericarps externally red, hairs numerous; mesocarps fleshy, juice red; endocarps small stones with wrinkled surfaces. Odor characteristic, aromatic; taste pleasant, sweet, acidulous.

For pharmaceutical purposes, Black Raspberries, the fresh ripe fruit of varieties of *Rubus occidentalis* Linné (Fam. *Rosaceæ*), may be substituted either in part or wholly for Red Raspberries.

RUBUS

Rubus

(U.S.P. VIII)

Blackberry Bark

The dried bark of the rhizome of *Rubus villosus* Aiton, *Rubus nigrobaccus* Bailey, or of *Rubus cuneifolius* Pursh (Fam. *Rosaceæ*).

In elongated, tough, flexible quills or bands, from 3 to 6 mm. in diameter, the bark from 1 to 2 mm. in thickness; outer surface deep red-brown or dark gray-brown, occasionally blackish-brown, somewhat scaly; inner surface yellow or pale brown, strongly and coarsely long straight-striate; fracture tough-fibrous; readily splitting. Inodorous; taste strongly astringent and bitter.

Rubus yields not more than 5 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

RUMEX

Rumex

Yellow Dock Curled Dock

The roots of *Rumex crispus* Linné, or of *Rumex obtusifolius* Linné (Fam. *Polygonaceæ*), without the presence of more than 5 per cent. of stem bases.

Usually split longitudinally or cut into transverse pieces about 2 cm. in length. The entire root, nearly simple, slightly tapering, with few if any rootlets, somewhat twisted, up to 30 cm. in length and 7 cm. in diameter, externally reddish-brown or grayish from adhering soil, finely annulate above, deeply wrinkled longitudinally, marked with small indented root scars which are often transversely elongated and with occasional stem scars or remains of stem, the latter being hollow and finely striated; leaf buds few, obconical; fracture short and dusty, somewhat fibrous.

The transverse section exhibits a yellowish or brownish cortex and a whitish or yellowish wood which is finely radiate in the outer portion. When examined under the microscope, it exhibits a thick cortex with several layers of cork, beneath which is an interrupted row of stone cells; a distinct cambium; and vascular bundles with few fibers.

The powder, when examined under the microscope, shows calcium oxalate crystals in rosette aggregates from 0.025 mm. to 0.06 mm. in diameter; numerous starch grains ellipsoidal or narrowly elongated, sometimes truncate, up to 0.025 mm. in length; stone cells from 0.04 mm. to 0.2 mm. in diameter, with walls somewhat lamellated, from 0.008 mm. to 0.025 mm. in thickness and with few simple pores; sclerenchymatous fibers few, thin-walled with simple pores; tracheæ up to 0.1 mm. in width with scalariform or reticulate thickenings of the wall; cork cells light brown.

Rumex yields not more than 10 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

SAMBUCUS

Sambucus

Sambuc. Elder Flowers

The air-dried flowers of *Sambucus canadensis* Linné or of *Sambucus nigra* Linné (Fam. *Caprifoliaceæ*), separated from the peduncles and pedicels.

Small, from 2 to 3 mm. in breadth, shriveled; calyx superior, five-lobed; corolla cream colored to brownish-yellow, rotate, flat or slightly campanulate, regularly five-lobed; stamens five inserted at the base of the corolla and alternating with its lobes, filaments slender, anthers oblong, yellow; pollen ellipsoidal or tetrahedral and rounded, covered with finely punctate markings and having three pores. Odor faintly sweet and aromatic; taste slightly bitter.

Sambucus yields not more than 8 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

SANTALUM ALBUM

Sandal Wood

Santal Alb. White Sandal Wood

The heart wood of *Santalum album* Linné (Fam. *Santalaceæ*).

In billets, pieces or chips of varying shapes and sizes, heavy, hard but splitting easily, color light yellow; transverse sections yellow to light reddish-brown, with alternating light and dark concentric zones nearly equal in diameter, with numerous pores and traversed by many very narrow medullary rays.

When examined under the microscope, sections show the medullary rays from two to four rows wide, the cells thick-walled and radially marked; the wood wedges consisting largely of wood fibers with pointed ends, large parenchyma and thick-walled secretion vessels and cells containing single crystals of calcium oxalate; the oil in globules adhering to the walls of the ducts and parenchyma cells and especially rich in the medullary cells. Odor characteristic, aromatic, persistent; taste peculiar, strongly aromatic.

Sandal Wood yields not more than 8 per cent. of ash.

SASSAFRAS MEDULLA

Sassafras Pith

(U.S.P. VIII)

Sassaf. Med.

The dried pith of *Sassafras variifolium* (Salisbury) O. Kuntz (Fam. *Lauraceæ*).

In sub-cylindrical, often curved or coiled pieces, from 2 to 10 cm. in length and from 2 to 5 mm. in diameter; very light in weight, externally whitish, occasionally with small fragments of adhering wood; fracture short. Odor slight, sassafras-like; taste mucilaginous.

When examined under the microscope, transverse sections of Sassafras Pith, mounted in phloroglucinol T.S. and hydrochloric acid, show nearly isodiametric cells with large intercellular spaces, the walls being more or less lignified and provided with numerous, simple pores; mounts made in water show the separation of a thin layer of mucilage from the inner walls of the cells, characterized by the gradual disappearance of the pores.

Macerate 0.5 Gm. of Sassafras Pith with 25 mils of cold distilled water for several hours and filter it through purified cotton; a mucilaginous solution is obtained which does not give a precipitate upon the addition of an equal volume of alcohol.

SCOPARIUS

Scoparius

(U.S.P. VIII)

Scopar. **Broom Tops**

The dried tops of *Cytisus scoparius* (Linné) Link (Fam. *Leguminosæ*).

Thin, flexible, branched twigs, from 2 to 3 mm. in thickness, five-angled; externally dark green, nearly glabrous, with numerous reddish-brown cork patches; internally yellowish, fracture short-fibrous, that of thicker pieces tough and splintery, upper leaves sessile, with often only one obovate leaflet present in small amount or absent. Odor slight, on bruising more distinct and peculiar; taste disagreeable, bitter.

Scoparius yields not more than 5 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

SCUTELLARIA

Scutellaria

(U.S.P. VIII)

Scutell. **Skullcap**

The dried plant of *Scutellaria lateriflora* Linné (Fam. *Labiatæ*).

About 50 cm. in length, smooth; stem quadrangular, branched; leaves opposite, petiolate, about 5 cm. in length, ovate-lanceolate or ovate-oblong, serrate; flowers about 6 mm. in length, in axillary one-sided racemes, with a pale blue corolla and bilabiate calyx, closed in fruit, the upper lip helmet-shaped. Odor slight; taste slightly bitter.

Scutellaria yields not more than 12 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

SENECIO

Senecio

Life Root

The dried overground portions of *Senecio aureus* Linné (Fam. *Compositæ*), gathered when flowering.

Stems from 3 to 6 dm. in length, if entire bearing a basal rosette of leaves; sparingly clothed with successively smaller leaves and bearing at the summit several yellow heads in a loose corymb, white floccose when young, but mostly glabrous when expanded, radical leaves on long, slender petioles, mostly of rounded form from 5 to 7 cm. in breadth, the base often cordate, the summit rounded, the margin crenate-dentate; stem-leaves gradually changing from the shape of the radical leaves to lyrately-pinnate, then pinnatifid and sessile, and at length clasping, oblong and incised; heads slender peduncled, from 12 to 25 mm. in breadth, the lance-linear involucral scales in about two series, closely appressed, rays about ten, bright-yellow, disk flowers very numerous, small, bearing a glabrous akene and a white pappus. Odor characteristically aromatic; taste bitter, slightly astringent and distinctly acrid and pungent.

Senecio yields not more than 10 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

SOLANUM

Solanum

Solan. Horse-nettle Berries

The air-dried ripe fruit of *Solanum carolinense* Linné (Fam. *Solanaceæ*).

Globose, slightly depressed, somewhat shriveled and wrinkled in drying, from 0.8 to 2 cm. in diameter, orange-yellow, glabrous, fleshy, two-celled, many-seeded, calyx and pedicel usually persistent; calyx stellate pubescent, deeply five-lobed, the lobes ovate or ovate-lanceolate, acuminate and enclosing half or more of the berry; seeds orbicular, flat, yellow, smooth, shining. Odor pepper-like; taste bitter and acrid.

Solanum yields not more than 6 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

STRONTII CARBONAS

Strontium Carbonate

Stront. Carb.

It contains, when dried to constant weight at 100° C., not less than 99 per cent. of $SrCO_3$ (147.62).

Strontium Carbonate occurs as a white powder, odorless and tasteless.

It is insoluble in water; dissolved with effervescence by diluted hydrochloric, nitric, or acetic acid; the addition of diluted sulphuric acid to these solutions produces a white precipitate.

One Gm. of the salt yields a clear, or not more than slightly turbid, solution with 10 mils of diluted hydrochloric acid (*sulphate*).

A solution of 0.1 Gm. of the salt in 10 mils of distilled water made with the aid of nitric acid does not immediately become more than slightly opalescent on adding silver nitrate T.S. (*chloride*).

Dissolve 1 Gm. of Strontium Carbonate in distilled water with the aid of a slight excess of acetic acid, dilute to 100 mils and to 10 mils of this solution add 5 drops of potassium dichromate T.S.; no turbidity develops within five minutes (*barium*).

Shake 2 Gm. of the salt with 25 mils of distilled water, filter, evaporate the filtrate and dry the residue at 100° C.; it weighs not more than 0.01 Gm. (*soluble substances*).

A solution of the salt in a slight excess of diluted hydrochloric acid does not respond to the Test for heavy metals (see page 357).

Assay.—Dissolve about 1.5 Gm. of Strontium Carbonate, dried to constant weight at 100° C. and accurately weighed, in 30 mils of normal hydrochloric acid V.S. and titrate the excess of acid with normal sodium hydroxide V.S., using methyl orange T.S. as indicator. It shows in the dried salt not less than 99 per cent. of $SrCO_3$.

Each mil of normal hydrochloric acid V.S. consumed is equivalent to 0.07381 Gm. of $SrCO_3$. Each gramme of Strontium Carbonate requires not less than 13.4 mils of normal hydrochloric acid V.S.

STRYCHNINÆ GLYCEROPHOSPHAS

Strychnine Glycerophosphate

Strych. Glycerophos. Strychnine Glycerinophosphate

The glycerophosphate [$(C_{21}H_{22}O_2N_2)_2PO_4H_2(C_3H_7O_2) + 6H_2O$ = 948.60] of the alkaloid strychnine. Preserve it in well-stoppered bottles.

Strychnine Glycerophosphate occurs in white, rhombic crystals or as a white powder; odorless; having at first a faint, sweet taste, afterward becoming intensely bitter.

One gramme dissolves in about 350 mils of water, the solution being neutral or slightly alkaline to litmus; also in about 310 mils of alcohol; slightly soluble in chloroform, and very slightly soluble in ether.

On incinerating 0.2 Gm. of the salt it yields no weighable residue.

The addition of sulphuric acid to the salt produces no color, or at most only a slight yellowish coloration, but on subsequently adding a fragment of potassium dichromate a deep blue color is obtained, which changes to deep violet, then to purplish-red, cherry-red and finally to orange or yellow.

Add ammonia water in slight excess to a saturated aqueous solution of the salt; a white precipitate is formed which is readily soluble in chloroform.

A saturated aqueous solution of the salt, acidulated with diluted nitric acid, is not rendered more than faintly turbid on the addition of silver nitrate T.S. (*chloride*).

A saturated aqueous solution of the salt, acidulated with hydrochloric acid, shows not more than a slight turbidity on the addition of barium chloride T.S. (*sulphate*).

Add a slight excess of ammonia water to an aqueous solution of the salt and filter the mixture; the filtrate shows not more than a slight turbidity with magnesia mixture T.S. (*phosphate*).

AVERAGE DOSE—Metric, 0.0015 Gm.—Apothecaries, $\frac{1}{40}$ grain.

STRYCHNINÆ VALERAS

Strychnine Valerate

Strych. Valer.

The valerate [$C_{21}H_{22}O_2N_2.HC_5H_9O_2$ = 436.28] of the alkaloid strychnine. Preserve it in well-stoppered, amber-colored vials.

Strychnine Valerate occurs as a white crystalline powder, having an odor of valeric acid and an intensely bitter taste.

It is sparingly soluble in water, becoming less soluble on keeping, through the loss of valeric acid; soluble in alcohol or chloroform; slightly soluble in ether.

Its saturated aqueous solution is neutral or slightly alkaline to litmus.

Dissolve about 0.05 Gm. of Strychnine Valerate in 2 mils of sulphuric acid; not more than a faint yellowish color appears, but on adding a fragment of potassium dichromate a deep violet color is produced which changes to orange or yellow.

When sulphuric acid is added to the salt, the odor of valeric acid is evolved.

Incinerate 1 Gm. of Strychnine Valerate; the ash does not exceed 0.1 per cent.

Ten mil portions of an aqueous solution of the salt (1 in 100) are not affected at once by barium chloride T.S. when acidulated with hydrochloric acid (*sulphate*) nor by silver nitrate T.S. when acidulated with nitric acid (*chloride*).

About 0.02 Gm. of the salt, moistened with nitric acid, may be colored yellow, but not red or reddish (*brucine*).

AVERAGE DOSE—Metric, 0.0015 Gm.—Apothecaries, $\frac{1}{40}$ grain.

SUCCUS CITRI

Lime Juice

Suc. Cit.

The expressed juice of the ripe fruit of *Citrus medica acida* (Roxburgh) Bonavia (Fam. *Rutaceæ*), containing in each *one hundred mils* not less than 5 Gm. nor more than 10 Gm. of total acids, calculated as crystallized citric acid [$H_3C_6H_5O_7 + H_2O$ = 210.08].

Lime Juice is a clear or slightly turbid, pale yellow or yellowish-green liquid, having the characteristic odor and taste of limes.

Specific gravity: 1.025 to 1.040 at 25° C.

Add 20 mils of solution of sodium hydroxide to 5 mils of Lime Juice in a 100 mil flask and heat on a water bath for ten minutes, with 0.5 Gm. of granular aluminum or aluminum foil; no odor of ammonia is noticeable at any time during the heating (*nitrate*).

Add 1 mil of barium chloride T.S. to 5 mils of clear, filtered Lime Juice; only a slight turbidity is produced after standing two minutes (*sulphate*).

Add 1 mil of nitric acid, followed by 0.1 mil of silver nitrate T.S. to 5 mils of clear, filtered Lime Juice; only a slight opalescence is produced after standing two minutes (*chloride*).

Warm a mixture of 5 mils each of sulphuric acid, alcohol, and Lime Juice; no odor of acetic ether is developed (*acetate*).

Add 1 mil of an aqueous solution of potassium acetate (1 in 4) to 5 mils of filtered Lime Juice and then add 15 mils of alcohol to the mixture; a slight cloudiness may occur but no crystalline precipitate is formed within fifteen minutes (*tartrate*).

When evaporated and ignited until free from carbon, Lime Juice leaves not more than 0.5 per cent. of ash. The ash from 5 mils of Lime Juice, when dissolved in a few drops of nitric acid and diluted with distilled water, shows not more than traces of phosphate when tested with ammonium molybdate T.S.

Transfer 10 mils of Lime Juice to a flask having a round bottom and a long neck, add 75 mils of distilled water, 5 mils of phosphoric acid and 1 Gm. of sodium bicarbonate and at once connect the flask with a condenser. Distil 50 mils, receiving the distillate under the surface of 25 mils of tenth-normal iodine V.S., acidulate the distillate with 5 drops of diluted hydrochloric acid, add 1 mil of barium chloride T.S. and heat on a water bath until the liquid is nearly colorless. The precipitate of barium sulphate, if any, when filtered, washed, and ignited, weighs not more than 0.015 Gm. corresponding to not more than 0.04 Gm. of sulphur dioxide in 100 mils of Lime Juice, correction being made for any sulphate which may be present in the 25 mils of tenth-normal iodine V.S.

To 200 mils of Lime Juice add an excess of calcium hydroxide and distil the liquid until the distillate measures 100 mils; the specific gravity of the distillate indicates not more than 2 per cent. of absolute alcohol, by volume, in the distillate, corresponding to 1 per cent. in the Lime Juice (limit of *alcohol*).

Add to 10 mils of Lime Juice, 1 mil of diluted sulphuric acid, then shake it with 25 mils of ether, separate the ether and evaporate it to dryness; the residue is not crystalline, and, when dissolved in 3 mils of distilled water and carefully neutralized with ammonia water, produces neither a pink precipitate nor a purplish color on the addition of 1 drop of ferric chloride T.S. (*benzoic or salicylic acid*).

Dilute 20 mils of Lime Juice with 100 mils of distilled water, filter, if necessary, and add 4 mils of diluted hydrochloric acid. Boil a piece of wool in a very dilute solution of potassium hydroxide T.S., wash with distilled water until free from alkali, then add the washed wool to the Lime Juice solution just prepared and boil for ten minutes. Remove the wool, wash thoroughly in distilled water, and boil in a very dilute solution of hydrochloric acid. After washing out the acid with distilled water, boil with about 200 mils of 2 per cent. solution of ammonium hydroxide until the color on the wool, if any, is dissolved. Remove the wool, add a slight excess of hydrochloric acid to the ammonia solution, and immerse in this solution another piece of wool which has been treated with potassium hydroxide solution in the manner described above. This second piece of wool should not be dyed (*artificial dyes*).

Assay.—Measure accurately 25 mils of Lime Juice, dilute it with 50 mils of distilled water and titrate the solution with normal potassium hydroxide V.S., phenolphthalein T.S. being used as indicator. Not less than 17.8 mils nor more than 35.7 mils of normal potassium hydroxide V.S. is required, indicating the presence of not less than 5 Gm. nor more than 10 Gm. of crystallized citric acid in 100 mils of the Lime Juice.

Each mil of normal potassium hydroxide V.S. corresponds to 0.07003 Gm. of citric acid ($C_6H_8O_7 + H_2O$). Each mil of Lime Juice requires not less than 0.713 mil nor more than 1.428 mils of normal potassium hydroxide V.S.

SUCCUS POMORUM

Fresh Apple Juice

Suc. Pomor.

The freshly expressed juice of sound, ripe, sour apples, the fruit of cultivated varieties of *Pyrus Malus* Linné (Fam. *Rosaceæ*).

TAMARINDUS

Tamarind

(U.S.P. VIII)

Tamarind.

The preserved pulp of the fruit of *Tamarindus indica* Linné (Fam. *Leguminosæ*).

A pulpy mass of a light reddish-brown color, changing with age to a dark brown, containing some branching fibers and numerous reddish-brown, smooth, oblong or quadrangular, compressed seeds, each enclosed in a tough membrane. Odor distinct; taste sweet and agreeably acid.

AVERAGE DOSE—Metric, 15 Gm.—Apothecaries, 4 drachms.

TEREBINTHINA

Turpentine

(U.S.P. VIII)

Terebinth.

A concrete oleoresin obtained from *Pinus palustris* Miller and from other species of *Pinus* (Fam. *Pinaceæ*).

Turpentine occurs in yellowish, opaque masses, lighter internally, sticky and more or less glossy, brittle in the cold. Odor and taste characteristic.

It is freely soluble in alcohol, ether, chloroform, or glacial acetic acid.

Its alcoholic solution is acid to litmus.

Dissolve about 1 Gm. of Turpentine, accurately weighed, in 25 mils of alcohol and collect the insoluble residue, if any, on a filter which has been dried at 100° C. and weighed. Then wash the residue and filter with about 25 mils of alcohol and dry at 100° C. The weight of the residue does not exceed 2 per cent. (*mechanical impurities*).

TEREBINTHINA LARICIS

Venice Turpentine

Terebinth. Laric. Larch Turpentine

A viscid oleoresin obtained from *Larix europoea* De Candolle (Fam. *Pinaceæ*).

Venice Turpentine is a nearly transparent, yellowish or yellowish-green, thick liquid, heavier than water, and having a distinctive odor and a bitter, characteristic taste.

Completely soluble in alcohol, glacial acetic acid, acetone, or chloroform. Almost

entirely soluble in petroleum benzin with the separation of a light flocculent deposit.

One part of Venice Turpentine dissolves completely and forms a clear solution in 3 parts of 80 per cent. alcohol.

It may possess a slight, greenish fluorescence when viewed by reflected light but exhibits no violet or purple fluorescence (*rosin oil*).

Dissolve 5 Gm. of Venice Turpentine in 25 mils of alcohol, add a few drops of phenolphthalein T.S. and render the solution slightly alkaline by the addition of a 10 per cent. solution of potassium hydroxide. The resulting solution is clear and transparent and no separation of oily drops occurs (*rosin oil*).

Its acid number is not more than 80 when determined as directed in the U. S. Pharmacopœia IX (see page 361).

THUJA

Thuja

Arbor Vitæ

The recently dried, leafy young twigs of *Thuja occidentalis* Linné (Fam. *Pinaceæ*), with stems not over 4 mm. in diameter, and without the presence of more than 1 per cent. of foreign substances.

Twigs fan-shaped, flattened, bearing the scale-like leaves appressed in four rows; leaves of the edges boat-shaped, the intermediate flat, those at the tips of the twigs very broad, the lower elongated, all bearing conspicuous glands on the back. Odor strongly balsamic, aromatic and pungent; taste camphoraceous, terebinthinate and bitter.

Thuja yields not more than 7 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

THYMUS

Thyme

The dried tops of *Thymus vulgaris* Linné (Fam. *Labiatæ*), collected when the plant is in flower.

Stems quadrangular, about 0.5 mm. in diameter, grayish-brown or purplish in color, pubescent, nodes from 5 to 20 mm. apart, occasionally with the opposite leaves attached; leaves linear, linear-lanceolate, or ovate-oblong, from 0.5 to 4 mm. in length and from 0.5 to 2 mm. in breadth, summit acute, base obtuse tapering into a petiole from 0.5 to 2 mm. in length, margin revolute, upper surface grayish-green, puberulent, with numerous one-celled, thick-walled, non-glandular hairs; lower surface grayish, pubescent, with non-glandular, one- to four-celled, thick-walled, rough simple hairs, up to 0.135 mm. in length and usually curved at the first joint in the bases; numerous compound glandular secreting hairs, with short one-celled stalk occurring chiefly on the upper surface and depressed in the cuticle, which give the leaf a glandular-punctate appearance; inflorescence in about twelve-flowered axillary whorls; flowers polygamous, calyx tubular, about 4 mm. in length, ovoid or slightly curved on the lower side near the base, from nine- to twelve-nerved, pubescent, the throat bearded with longitudinally striated, straight simple hairs up to 1 mm. in length, bilabiate, upper lip three-toothed, lower lip with two hairy, ascending, attenuate divisions, corolla about twice as long as the calyx, purplish, smooth within, slightly pubescent without, upper lip emarginate, lower spreading and three-lobed, stamens slightly didynamous and exserted, stigma bifid; nutlets about 0.5 mm. in diameter, spheroidal and finely tuberculate. Odor agreeable, aromatic; taste aromatic and warming.

Thyme yields not more than 14 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

TRIFOLIUM

Trifolium

Trifol. Red Clover Blossoms

The dried inflorescence of *Trifolium pratense* Linné (Fam. *Leguminosæ*).

Heads ovoid with rounded summit, mostly from 12 to 25 mm. in length and breadth, shriveled, purplish and more or less brown from drying, consisting of many small papilionaceous flowers, crowded together and clothed at the base with broad, pointed ciliate stipules of a pale green color with darker veins, and which may or may not be accompanied by diminutive trifoliate leaves. Flowers from 12 to 15 mm. in length, longer than the four nearly equal teeth and shorter than the narrower fifth tooth; calyx-teeth subulate, tapering; petals united into a tube below, the standard longer than the wings but when recurved appearing shorter; stamens diadelphous (nine and one); style slender. Odor faintly aromatic and somewhat tea-like; taste sweetish, then slightly bitter.

Trifolium yields not more than 10 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

TRILLIUM

Trillium

Trill. Beth Root

The dried rhizome of *Trillium erectum* Linné and closely allied species of *Trillium* (Fam. *Liliaceæ*).

Rhizome oblique, globular, oblong or obconical, truncate below, terminated by a small bud surrounded by a sheath of scarious leaf bases, annulated by leaf scars and fissured by stem scars; from 0.6 to 5 cm. in length and from 0.6 to 2.5 cm. in width, more or less compressed laterally, rootlet scars in several concentric rows on the under side in the upper portions; externally yellowish to reddish-brown; internally of a pale yellow; fracture somewhat uneven with a more or less spongy appearance. Odor distinct; taste bitter and acrid with a sensation of warmth in the throat, and when chewed causing an increased flow of saliva.

Trillium yields not more than 5 per cent. of ash.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

VANILLA

Vanilla

(U.S.P. VIII)

Vanilla Bean

The cured, full-grown, unripe fruit of *Vanilla planifolia* Andrews (Fam. *Orchidaceæ*).

Pods linear, flattened, from 15 to 35 cm. in length and from 5 to 9 mm. in breadth; summits terminating in flat circular scars; gradually tapering, more or less bent and curved or hooked at the bases, or in the Tahiti variety, broad in the middle and tapering towards either end, the base closely resembling the summit; externally blackish-brown, longitudinally wrinkled, moist-glossy; occasionally with an efflorescence of vanillin in the form of acicular crystals or monoclinic prisms; frequently with narrow, elliptical or irregular, more or less wrinkled, dark-brown patches of cork; occasionally

split into three parts near the tip, flexible and tough, one-celled, containing a blackish-brown pulp and numerous blackish-brown seeds; the latter being flattened, irregularly triangulate or nearly circular in outline, reticulate and varying from 0.25 to 0.3 mm. in diameter. Odor and taste characteristic and very agreeable.

Under the microscope, transverse sections of the pods of Vanilla show an epidermis with a somewhat thickened outer cuticularized layer having occasionally rounded or conical masses of an excretion of a gum-like substance; a layer of collenchyma of one or two rows of cells; a thick sarcocarp composed of parenchyma cells in which are imbedded an interrupted circle of fibro-vascular bundles; the parenchyma cells are deeply undulate in outline and usually contain a thin protoplasmic layer enclosing numerous oily globules or may contain bundles of raphides of calcium oxalate; the individual crystals varying from 0.2 to 0.4 mm. in length; some of the parenchyma cells are specially modified and distinguished by their somewhat thickened walls with long, oblique, slit-like pores or the thickening may extend in the form of broad, spiral bands; in the fibro-vascular bundles the phloem is central, being more or less surrounded by a few tracheæ, the walls possessing slit-like pores or spiral thickenings, and at the outside of the bundle is a closed circle of sclerenchymatous fibers, the walls being thin, strongly lignified, provided with numerous, transverse, simple pores, the outer wall of the outer row of fibers being irregular or sinuate; from the inner walls of the endocarp arise the placentæ bearing numerous brownish-red or blackish seeds, and from the cells of the endocarp also arise numerous long, nearly straight hairs, the ends being rounded, the hairs being more or less matted together by a gummy or resinous mass in which some of the seeds are held; in mounts made in hydrated chloral T.S. or potassium hydroxide T.S., the immature, brownish-red seeds show a deeply reticulate seed-coat, with cells of an oblong-polygonal form in surface view.

Place a few of the crystals, occurring as an efflorescence on the fruit, on a microscope slide or watch crystal and add a drop of phloroglucinol T.S. and hydrochloric acid; the solution immediately acquires a carmine-red color (distinction from *benzoic acid*).

The amount of extractive yielded to dilute alcohol should not be less than 12 per cent.

Vanilla yields not more than 6 per cent. of ash.

VERBASCI FLORES

Mullein Flowers

Verbasc. Flor.

The dried corollas, with adhering stamens, of *Verbascum phlomoides* Linné or of *Verbascum thapsiforme* Schraeder (Fam. *Scrophulariaceæ*). Preserve the flowers in tightly-closed containers.

Corolla light-yellow, the outer surface grayish with a fine, soft, woolly indumentum, the inner surface sparsely hairy and finely veined; tube of the corolla only 1 or 2 mm. in length and almost equally broad, the limb from 14 to 30 mm. in breadth, between wheel-shaped and saucer-shaped, obscurely two-lipped, the unequal lobes rounded-obovate. Stamens five, borne on the base of the corolla, shorter than the corolla, two of them longer than the other three, the filaments thick and fleshy, more or less pilose, especially the three shorter ones, usually orange colored. Stamen-hairs cylindrical, unicellular, non-branching, surface minutely reticulate, apex rounded, frequently enlarged. Pollen grains smooth, triangular and more or less rounded, from 0.025 to 0.03 mm. in diameter.

The flowers impart a yellow color to boiling water, and a rather permanent green color with dilute sulphuric acid, the latter color becoming brown upon the addition of alkalies. Odor peculiar, agreeable; taste mucilaginous, not agreeable.

Mullein Flowers yield not more than 6 per cent. of ash.

AVERAGE DOSE—Metric, 8 Gm.—Apothecaries, 2 drachms.

VERBASCI FOLIA

Mullein Leaves

Verbasc. Fol.

The dried leaves of *Verbascum Thapsus* Linné (Fam. *Scrophulariaceæ*), and of other species of *Verbascum*.

Obovate with narrowed base, or varying to oblong or oblong-lanceolate, without a true petiole, obtuse or tending toward acuteness at the summit, from 1 to 6 dm. in length and from 3 to 15 cm. in breadth; very thick, rather tough, light yellowish-gray or greenish-gray, densely long-tomentose, with numerous, multicellular, branching, non-glandular hairs. Nearly odorless; taste mucilaginous and slightly bitter.

Verbascum yields not more than 14 per cent. of ash.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

VERBENA

Verbena

Verben. Blue Vervain

The dried overground portion of *Verbena hastata* Linné (Fam. *Verbenaceæ*), collected when flowering.

In broken or cut pieces; stem stout, obtusely quadrangular, rough, pubescent; leaves opposite, petioles from 12 to 25 mm. in length, blades from 6 to 12 cm. in length, lanceolate, acuminate, acute, coarsely and sharply serrate or the lower hastate lobed, deep green above, paler beneath, conspicuously veined; flowers in terminal interrupted panicles of spikes, spikes erect cylindraceous, densely flowered, each flower subtended by a lanceolate acute bract; calyx adherent, little more than half the length of the corolla, tubular, five-lobed, the mouth slightly oblique; corolla small, bright blue, salver-form tube externally pubescent, sub-equally five-lobed; stamens adnate to the corolla tube, included, didynamous; fruit dividing at maturity into four one-seeded parts. Odor heavy, especially if dampened; taste bitter and disagreeable.

Verbena yields not more than 10 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

VIBURNUM OPULUS

Viburnum Opulus

Viburn. Opul. High Bush Cranberry Bark

The dried bark of *Viburnum Opulus* Linné var *americanum* (Miller) Aiton (Fam. *Caprifoliaceæ*), without the presence of more than 5 per cent. of wood and other foreign matter.

In strips, or occasionally in quills or chip-like fragments, the bark attaining a thickness of 3 mm.; outer surface of the thinner pieces of a light gray color with crooked, longitudinal, purplish-brown stripes and very small brown lenticels, the thicker pieces purplish-red or occasionally blackish, except when very young, and more or less finely fissured or thinly scaly; inner surface varying in color from yellowish to rusty-brown, with very short oblique striæ, except where the outer wood layer

adheres; fracture short and weak, the fractured surface mostly whitish, varying to pale brown in the inner layer, rusty brown in the outer layer, covering the green tangential layers of phelloderm. Odor strong and characteristic; taste mildly astringent and decidedly bitter.

Under the microscope, sections of Viburnum Opulus show an outer corky layer, of five to twenty-five rows of cells, the walls being nearly colorless, frequently thickened on the inner surface, individual cork cells from 0.015 to 0.045 mm. in radial diameter and from 0.030 to 0.075 mm. in tangential diameter; outer bark of about ten rows of cells containing a brownish-yellow, amorphous substance, small starch grains or chloroplastids; medullary rays one to two cells in width, usually not more than one-cell wide; inner bark with occasional groups of bast fibers composed of one to ten cells, the walls being very thick, non-lignified, lamellated and finely porous; adhering wood with large tracheæ having scalariform or reticulate thickenings, and being surrounded by wood fibers with thick lignified walls; starch grains, mostly in cells of parenchyma and medullary rays, either single or compound, the individual grains not exceeding 0.006 mm. in diameter; calcium oxalate in rosette aggregates, 0.015 to 0.04 mm. in diameter, numerous fragments of parenchyma cells, the lumina filled with a reddish-brown amorphous substance.

The powder of Viburnum Opulus is light grayish-brown, consisting of irregular fragments; polygonal cork cells, with thin, colorless walls; parenchyma with rosette aggregates of calcium oxalate, from 0.015 to 0.04 mm. in diameter; starch grains very small and mostly in parenchyma cells; fragments of parenchyma containing a brownish-yellow amorphous substance; occasional tracheal fragments associated with lignified wood fibers, bast fibers and stone-cells.

AVERAGE DOSE—Metric, 2 Gm.—Apothecaries, 30 grains.

VINUM XERICUM

Sherry Wine

Vin. Xeric.

An alcoholic liquid made by fermenting the juice of fresh ripe grapes, the fruit of cultivated species of *Vitis* Linné (Fam. *Vitaceæ*), freed from seeds, stems and skins, and fortifying with pure grape brandy. It contains not less than 16 per cent. nor more than 24 per cent. of C_2H_5OH, by volume, when estimated as directed in the U. S. Pharmacopœia IX. Preserve it in well-closed casks or in well-stoppered bottles, in a cool place.

Sherry Wine is a pale yellowish-brown or amber-colored liquid, having a pleasant, aromatic odor, free from yeastiness, and having a fruity, characteristic taste without excessive sweetness or acidity.

Specific gravity: from 0.985 to 1.000 at 25° C.

Evaporate 100 mils of Sherry Wine in a tared dish, on a water bath, and dry the residue to constant weight at 100° C.; it weighs not less than 3 Gm. nor more than 7 Gm. Ignite this residue at a low temperature and burn it gradually to whiteness, moisten the ash with a small portion of ammonium carbonate T.S. and again carefully ignite; the ash weighs not less than 0.175 Gm. nor more than 0.5 Gm.

Dilute 50 mils of Sherry Wine with 200 mils of distilled water; it requires for neutralization not less than 20 mils nor more than 40 mils of tenth-normal potassium hydroxide V.S., using phenolphthalein T.S. as indicator (*free acid*).

Acidulate 50 mils of Sherry Wine with hydrochloric acid, heat and add an excess of barium chloride T.S. Collect the precipitate on a filter of known ash content, wash it thoroughly, dry, and ignite; the residue weighs not more than 0.034 Gm. (*sulphate*).

To 10 mils of Sherry Wine add an equal volume of distilled water and 5 drops of ferric chloride T.S.; not more than a faint greenish-brown color appears (*tannic acid*).

Add 10 mils of diluted sulphuric acid to 75 mils of Sherry Wine and shake out the mixture in a separator twice, using each time 20 mils of a mixture of equal volumes of purified petroleum benzin and ether. Transfer the separated benzin-ether solution to an evaporating dish, allow the solvent to evaporate spontaneously and dissolve the residue in 3 mils of distilled water; the solution does not have a sweet taste (*saccharin*) nor does it yield a violet color upon the addition of a few drops of a dilute solution of ferric chloride (1 in 200) (*salicylic acid*).

XANTHOXYLI FRUCTUS

Prickly Ash Berries

Xanthox. Fruct.

The dried fruit of *Xanthoxylum americanum* Miller (Northern Prickly Ash) or *Xanthoxylum Clava-Herculis* Linné (Southern Prickly Ash) (Fam. *Rutaceæ*).

Capsules with short stalks (*X. americanum*) or without stalk (*X. Clava-Herculis*); when fresh, ellipsoidal, fleshy, gray-brown, when dry, dehiscent; carpels two, convex, summit short pointed; seeds one or two, oblong, black, shining, and wrinkled from drying. The carpels have a pungent, warm, aromatic taste and on chewing leave a tingling sensation on the tongue; when breathed upon they emit a faintly aromatic odor resembling that of citral.

Prickly Ash Berries yield not more than 7 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

ZEA

Zea

(U.S.P. VIII)

Corn Silk

The fresh styles and stigmas of *Zea Mays* Linné (Fam. *Gramineæ*).

In slender filaments from 10 to 20 cm. in length, and about 0.4 mm. in diameter; of a light green, purplish-red, yellow or light brown color; stigmas bifid, the segments very slender, frequently unequal and from 0.4 to 3 mm. in length.

Under the microscope, the styles are seen to consist for the most part of parenchyma and two parallel, vascular bundles with narrow, spiral or annular tracheæ; the epidermal cells are rectangular, many of these being extended into multicellular hairs, the latter being from 0.2 to 0.8 mm. in length, the basal portion consisting of two to five united cells, the upper portion being usually unicellular; the cells of the hairs are rich in cytoplasm and usually contain a small, spherical nucleus; the purplish-red styles contain a purplish-red cell cap.

Digest a small portion of the fresh styles and stigmas in diluted alcohol and filter; a pale purplish-red solution is produced, separate portions of which, on the addition of acids, become distinctly purplish or yellowish-red; on the addition of alkalies, green; on the addition of ferric chloride T.S., olive-green changing to greenish-brown; and on the addition of an aqueous solution of alum, bluish or purplish, the color being quite permanent.

AVERAGE DOSE—Metric, 4 Gm.—Apothecaries, 1 drachm.

ZEDOARIA

Zedoary

Zedoar.

The dried rhizome of *Curcuma Zedoaria* (Bergius) Roscoe (Fam. *Zingiberaceæ*).

Usually cut into transverse rounded sections, twisted and wrinkled, from 1 to 4 cm. in diameter, and from 5 to 10 mm. in thickness; externally grayish-brown, hairy, rough, with few root scars; transverse surface pale reddish to gray-brown; a distinct, dark circular endodermis, which is from 2 to 5 mm. in width, separates the cortex; the stele contains numerous, orange-colored resin cells and irregularly distributed, lighter colored wood bundles which are fewer in the cortex; fracture short, somewhat mealy and waxy. Odor aromatic, camphor-like; taste aromatic, warm, slightly bitter.

Under the microscope, sections show a thick cork, a thin epidermis with numerous characteristic hairs, thick-walled, one- to six-celled, up to 1 mm. in length and often thicker in the middle than at the base; the parenchyma of the cortex and of the central cylinder rich in starch; secretion cells isodiametric with suberized walls, contents colorless or yellowish; the endodermis of small, thin-walled quadratic cells, the fibro-vascular bundles collateral, more numerous in the central cylinder and nearer the endodermis; few bast fibers in the cortex and no crystal cells.

The powder contains numerous starch-grains which are ovoid, from 0.02 to 0.07 mm. in length and from 0.007 to 0.03 mm. in thickness, having the point of origin of growth in the smaller end of the grain; numerous characteristic, thick-walled hairs; rich in parenchyma; very few bast fibers; no calcium oxalate crystals or stone cells.

Zedoary yields not more than 7 per cent. of ash.

AVERAGE DOSE—Metric, 1 Gm.—Apothecaries, 15 grains.

THE NATIONAL FORMULARY

PART III

SPECIAL TESTS AND REAGENTS

(Reprinted from the U. S. Pharmacopœia IX by special permission of the Trustees of the U. S. Pharmacopœial Convention.)

Arsenic Test

Test Apparatus.—Prepare several generators, equipped with tubes, etc., as described below. Select as a generator a bottle of about 50 mils capacity, having a mouth about 2.5 cm. in diameter and provide a well-fitting rubber stopper, suitably perforated. In the perforation in this stopper insert a vertical exit tube about 13 cm. in total length and 1 cm. in diameter throughout the upper portion (for about 10 cm.) and constricted at its lower extremity to a tube of about 3 cm. in length and about 5 mm. in diameter. This latter tube should extend but slightly below the stopper. In the lower wide part of this exit tube insert a small pledget of dry glass wool (see page 361) and then a strip of the freshly prepared but dry lead acetate test paper (see page 362) rolled into a coil, and above this a plug of the moist (not wet) lead acetate glass wool (see page 362). In the upper extremity of this tube insert through a perforated cork stopper, a glass tube 12 cm. in length, having an internal diameter of about 3 mm. Place the mercuric bromide test paper (see page 362) in this tube, bending or creasing the upper portion of the strip so that it will retain its position. The strip should extend within about 2 cm. of the perforated cork stopper and must not be introduced into the tube until ready to start the test. This tube should be thoroughly cleaned and dried each time it is used.

Standard Arsenic Test Solution.—Dissolve 0.1 Gm. of arsenic trioxide (see page 361), which has been finely pulverized, dried in a desiccator, and accurately weighed, in about 5 mils of a 20 per cent. solution of sodium hydroxide (free from arsenic). Neutralize the solution with diluted sulphuric acid (free from arsenic), add 10 mils of the same acid and sufficient recently boiled distilled water to bring the volume of the solution to exactly 1000 mils at 25° C. Accurately measure 10 mils of this solution, transfer it to a 1000 mil flask, add 10 mils of diluted sulphuric acid (free from arsenic) and make up the volume with recently boiled distilled water to exactly 1000 mils at 25° C. Employ this solution, containing 0.001 milligramme of arsenic trioxide in each 1 mil (at 25° C.), in preparing the standard stain. Keep this solution in a glass-stoppered bottle. It is advisable to make fresh solutions whenever new standard stains are to be prepared.

Preparation of the Chemical to be Tested.—Add 1 mil of a mixture of equal volumes of concentrated sulphuric acid (see page 363) and distilled water, to 5 mils of an aqueous solution of the chemical (1 in 25) or to a solution in 5 mils of distilled water of the residue remaining after any special treatment that may be directed. This acidulation is not necessary in the case of inorganic acids. Now, unless specially directed, add 10 mils of a saturated aqueous solution of sulphurous acid (see page 363). Evaporate this liquid in a small beaker, on a water bath, until it is free from sulphurous acid and has been reduced to about 2 mils in volume. Dilute this evaporated liquid to about 5 mils with distilled water.

The Test for Arsenic

Preparation of the Standard Stain.—Introduce into the generator from 8 to 10 Gm. of zinc (see page 364) followed by 25 mils of dilute sulphuric acid, prepared by mixing 1 part of concentrated sulphuric acid, free from arsenic (see page 363), with 4 parts of distilled water, and 5 drops of acid stannous chloride T.S. (see page 363). Add at once 2 mils (accurately measured at 25° C.) of the standard arsenic T.S. (see page 361), and immediately insert the stopper containing the exit tube, into which have been placed the glass wool pledget, the dry lead acetate test paper, the moist lead acetate glass wool, and the mercuric bromide test paper, as described under the Test Apparatus (see page 355). Should the evolution of the gas be violent at first, check the reaction by immersing the bottle in cold water. Should the reaction subside, increase it by placing the bottle in warm water. If the reaction be too violent, the stain will spread and not form a distinctive band, thus making the comparisons of color intensity difficult. After the test has continued for forty-five minutes, remove the mercuric bromide test paper and place it in a clean, dry tube for comparison. This stain represents 0.002 milligramme of arsenic trioxide in addition to any stain produced by the reagents. The stain from the reagents should scarcely be perceptible when determined by a blank experiment. Since light, heat and moisture cause the stain to fade rapidly, comparison should be made as soon as possible. The stained test papers may be preserved by either dipping in hot, melted paraffin or keeping them over phosphoric anhydride protected from light.

Testing the Chemical.—Introduce into another generator from 8 to 10 Gm. of the zinc, followed by 25 mils of the dilute sulphuric acid (1 to 4) and 5 drops of acid stannous chloride T.S. Insert the stopper containing the exit tube charged with the test papers and glass wool, as just described. Then add 5 mils of the solution to be tested, previously treated as directed, under *Preparation of the Chemical* (see above), and immediately insert the stopper charged with the test papers and glass wool. When the evolution of hydrogen has proceeded actively for forty-five minutes, remove the mercuric bromide test paper and carefully compare it with the standard stain prepared as described above. The stain produced by the chemicals tested does not exceed in length or intensity of color that prepared as the standard, indicating not more than 1 part of arsenic in 100,000 parts of the substance tested.

Interfering Chemicals.—Antimony, if present in the substance tested, will produce a gray stain. *Sulphites, sulphides, thiosulphates,* and other compounds which liberate hydrogen sulphide or sulphurous acid when treated with sulphuric acid, must be oxidized by means of nitric acid and then reduced by means of sulphurous acid as directed under *Preparation of the Chemical to be Tested* (see above), before introducing them into the apparatus. *Sulphur compounds* as well as *hydrogen phosphide*

give a bright yellow band on the test paper. If sulphur compounds are present, a simultaneous darkening of the lead acetate test paper and glass wool will occur. If such is the case, the operation as directed under *Preparation of the Chemical to be Tested* (see page 356) must be repeated upon a fresh portion of the solution being tested, using greater care in effecting the complete removal of the sulphurous acid. In testing hypophosphites special care should be observed to completely oxidize the solution being tested as directed, otherwise a yellow stain may be produced through the evolution of hydrogen phosphide, which might be confused with the orange-yellow color produced by arsenic. *Compounds containing antimony* should be tested for *arsenic* by Bettendorf's Test (see below).

The test apparatus should be thoroughly cleaned and dried immediately before and after use.

Arsenic Test, Bettendorf's

This test is employed only in testing salts of *bismuth* and compounds containing *antimony* for the presence of arsenic.

To a solution of the prescribed quantity of the substance to be tested in 5 mils of concentrated hydrochloric acid (see page 361) contained in a clean test tube, add 10 mils of saturated stannous chloride T.S. (see page 363) which has been freshly prepared, and set it aside for thirty minutes. If arsenic is present in non-permissible amounts, a brownish tint or precipitate will be seen when the tube is placed over a white surface and the solution viewed from above, comparison being made with a mixture of 5 mils of concentrated hydrochloric acid (see page 361) with concentrated stannous chloride T.S., prepared as directed above.

NOTE.—It is absolutely necessary that for this test the solution of stannous chloride be freshly prepared, and that nitrates, sulphates, sulphites, sulphides, and compounds of mercury, gold, and selenium be absent from the reagents, and the chemicals being tested.

Test for Heavy Metals

Chemicals.—This test is to be used to detect the presence of undesirable metallic impurities in official chemical substances or their solutions; these must not respond affirmatively within the stated time. Acidulate 10 mils of a solution of the substance in distilled water (1 in 50), contained in a test tube of about 40 mils capacity and of about 2.5 cm. diameter, with 1 mil of diluted hydrochloric acid (unless otherwise directed),* warm it to about 50° C., add an equal volume of freshly prepared hydrogen sulphide T.S., stopper, and allow the mixture to stand at 35° C. for half an hour. At the end of this time the mixture should still possess the odor of hydrogen sulphide; if not, it should be thoroughly saturated with the gas and again set aside for half an hour. Any change in the color of the solution which is being tested is noted by comparison with the same volume of the hydrogen sulphide T.S. (which has been likewise acidulated), when viewed crosswise by reflected light while held against a white surface.

Volatile Oils.—Shake 10 mils of the oil with an equal volume of distilled water to which a drop of hydrochloric acid has been added and pass hydrogen sulphide through the mixture until it is saturated; no darkening in color will be produced in either the oil or the water (*lead or copper*).

*First neutralize solutions of acids carefully by the addition of ammonia water and then acidify as above directed.

Assay for Bromides, Chlorides, or Iodides

Chlorides.—Dissolve about 0.2 Gm. of the salt to be assayed, accurately weighed (corresponding to from 30 to 40 mils of tenth-normal silver nitrate V.S.), in 25 mils of distilled water in a 200 mil graduated flask. Add 50 mils of tenth-normal silver nitrate V.S. to the solution, and, after adding 5 mils of nitric acid, add sufficient distilled water to make 200 mils and mix the contents well. Then filter the mixture through a dry filter into a dry flask, and reject the first 20 mils of the filtrate. Add 2 mils of ferric ammonium sulphate T.S. to 100 mils of the subsequent filtrate and then titrate with tenth-normal potassium sulphocyanate V.S., until the supernatant liquid remains reddish after it is well shaken. Multiply the number of mils of tenth-normal potassium sulphocyanate V.S. required by 2 and subtract this figure from the number of mils of tenth-normal silver nitrate V.S. added. The difference, multiplied by the equivalent of the respective chloride represents the amount of chloride present in the weight of the salt or solution taken.

Bromides and Iodides.—Dissolve about 0.4 Gm. of the salt (if a bromide, or 0.5 Gm. of the salt if an iodide), accurately weighed, in 25 mils of distilled water in a glass-stoppered flask. Add 50 mils of tenth-normal silver nitrate V.S. to the solution, then, after adding 2 mils of ferric ammonium sulphate T.S. and 2 mils of nitric acid, determine the excess of silver nitrate by titrating with tenth-normal potassium sulphocyanate V.S. until the supernatant liquid remains reddish after it is well shaken.

The difference between the number of mils of tenth-normal silver nitrate V.S. added and the number of mils of tenth-normal potassium sulphocyanate V.S. used, multiplied by the equivalent of the respective bromide or iodide being assayed represents the amount of the bromide or iodide present in the weight of the salt taken. This difference, divided by the weight of the salt taken, represents the number of mils of tenth-normal silver nitrate V.S. required by 1 Gm. of the salt.

Assay for Alkali Salts of Organic Acids

Heat about 2 Gm. of the salt to be assayed, accurately weighed, in a platinum or porcelain crucible, at first very gently, then gradually raise the temperature until the salt is thoroughly carbonized. (Do not use platinum crucibles for lithium salts.) The final temperature must not exceed a dull red heat and the flame of the burner must not come in contact with the carbonized mass. After allowing the carbonized mass to cool, disintegrate it with the aid of a stout glass rod and transfer the mass and crucible to a beaker. Add 50 mils of distilled water and 50 mils of half-normal sulphuric acid V.S., cover the beaker with a watch glass and boil the contents for thirty minutes. Then filter the solution and wash the residue with hot distilled water until the washings cease to redden blue litmus paper. Now determine the residual acid in the cooled filtrate by titration with half-normal potassium hydroxide V.S., using methyl orange T.S. as indicator. The difference between the number of mils of half-normal sulphuric acid V.S. added and the number of mils of half-normal potassium hydroxide V.S. used, multiplied by the respective equivalent of the salt represents the amount of salt present in the amount taken.

Determination of Ash or Non-volatile Matter

Chemicals.—Weigh accurately from 1 to 2 Gm. of the chemical or the amount directed in the text, and place it in a tared platinum or porcelain crucible. Ignite it, at first very gently, and then gradually raise the temperature until the carbon, if formed, is completely burned off. Conduct the ignition in a place protected from air currents and use as low a temperature as possible to effect the combustion of the carbon. When the carbon has completely disappeared, transfer the crucible while still hot to a desiccator and weigh it when cold. In the case of substances which increase in volume on ignition, or where it is very difficult to burn off the carbon, the determination is facilitated by using a platinum dish of suitable size, or by igniting the weighed quantity of the substance, in the manner described above, in several separate portions.

To test for non-volatile matter in volatile inorganic chemicals proceed as directed above, using as low a temperature as possible.

Vegetable Drugs.—Incinerate 2 Gm. of the ground drug until free from carbon and of constant weight, using a tared crucible and the lowest temperature possible, then determine the weight of the ash. If a carbon-free ash cannot be obtained in this way, exhaust the charred mass with distilled water, collect the insoluble residue on a filter paper of known ash content, incinerate the residue and filter paper until the ash is white or nearly so, then add the filtrate, evaporate it to dryness and heat the whole to a low redness. Finally determine the weight of the ash, deducting the weight of the ash from the filter.

Determination of Crude Fiber

Exhaust a weighed quantity of the ground material, representing about 2 Gm. of the drug, with ether or use the residue from the determination of the volatile extract soluble in ether (see below). Add 200 mils of boiling sulphuric acid solution, adjusted to exactly 1.25 per cent. by titration, to the ether-exhausted drug, in a 500 mil flask and connect the flask with a reflux condenser, the tube of which passes only a short distance below the rubber stopper, into the flask. Heat the mixture to boiling and continue the boiling during thirty minutes. Then filter the mixture through asbestos or glass wool and wash the residue on the filter with boiling distilled water until the washings are no longer acid. Rinse the residue back into the flask with 200 mils of boiling sodium hydroxide solution, adjusted to exactly 1.25 per cent. by titration, and free from sodium carbonate. Again heat the mixture to boiling and continue the boiling during thirty minutes under the reflux condenser as described under the treatment with acid, then rapidly filter through a tared filter, wash the residue with boiling distilled water until the washings are neutral, dry it at 110° C. until of constant weight and note the weight. Now completely incinerate the dried residue and weigh the ash; the loss of weight is considered to be the crude fiber.

Determination of Volatile Extractive, Soluble in Ether

Extract completely 2 Gm. of the thoroughly dried and ground drug by subjecting it, during twenty hours, to the action of anhydrous ether in a continuous extraction apparatus. Transfer the ethereal solution to a tared porcelain dish and allow it to evaporate spontaneously. Then dry it in a desiccator over sulphuric acid during eighteen hours and weigh the total ether extract. Now heat the extract gradually up to 110° C. until the weight becomes constant; the loss in weight during the heating represents the volatile portion of the extract.

Determination of Non-volatile Extractive, Soluble in Ether

Proceed as directed under Determination of Volatile Extractive, Soluble in Ether (see page 359). The weight of the extract after drying in a desiccator and then at 110° C. until of constant weight represents the non-volatile portion of the extract.

Determination of Alcohol in Official Preparations

Place 25 mils of the preparation, measured at 15.56° C., in a distilling flask of about 200 mils capacity, provided with a high side tube connected with a suitable condenser; add 50 mils of distilled water, distil into a 50 mil graduated flask, at such a rate that about 48 mils of distillate will be received in a half hour; if volatile products other than alcohol are known to be absent, bring to the original temperature and dilute with water of the same temperature to 50 mils.

Determine the specific gravity of the distillate at any definite temperature between 15° and 30° C. by means of a pycnometer or Westphal balance, and find the per cent. of absolute alcohol by volume by reference to the alcoholometric tables (see U.S.P. IX, page 633 *et seq.*), and multiply by the dilution factor to find the per cent. of alcohol in the original preparation.

If the preparation is suspected to contain less than 25 per cent. of alcohol, 50 mils should be taken for analysis; if it is suspected to contain over 50 per cent. of alcohol, 12.5 mils should be taken for analysis. In either case, the volume of the distillate should be made up as usual to 50 mils.

If the preparation contains iodine, combine it with zinc dust. (Sodium thiosulphate may be used instead of zinc dust, in which case several drops of sodium hydroxide T.S. should be added to prevent sulphur from distilling over.)

If volatile acids are present, neutralize with sodium hydroxide T.S.; if volatile bases are present, neutralize with dilute sulphuric acid; if both volatile acids and volatile bases are present, neutralize first with dilute sulphuric acid and distil about 50 mils, then neutralize this with sodium hydroxide T.S., and distil once more to obtain in the usual manner 50 mils.

If acetone, camphor, chloroform, ether, glycerin (30 per cent. or over), volatile oils or other volatile products are known or suspected to be present, transfer the first distillate to a separatory funnel and saturate it with sodium chloride, add 15 mils of petroleum benzin (boiling point 40°–50° C.) and shake the mixture for one or two minutes. After the liquids have completely separated, draw off the lower alcoholic salt solution into a second separator, and repeat the extraction with 15 mils of petroleum benzin; draw off the lower alcoholic salt solution into a distilling flask of about 200 mils capacity, wash the combined petroleum benzin solutions with about 25 mils of saturated sodium chloride solution and add the washings to the distilling flask. Distil into a 50 mil graduated flask at such a rate that about 45 to 48 mils of distillate are received within a half hour. Bring to the original temperature, dilute with water of the same temperature to 50 mils, and determine the specific gravity and alcoholic per cent. as directed above.

Test for Methyl Alcohol

Dilute the Alcohol with distilled water until it contains about 10 per cent., by volume, of ethyl alcohol. Transfer 5 mils of the dilute alcohol to a test tube, add to it 2 mils of a potassium permanganate solution (made by dissolving 3 Gm. of potassium permanganate in 100 mils of distilled water) and 0.3 mil of sulphuric acid, and allow the mixture to stand for five minutes. Now dissolve the precipitate of manganese dioxide by the addition of sulphurous acid, drop by drop with agitation, then add 1 mil of sulphuric acid and 5 mils of fuchsin-sulphurous acid T.S. and mix them. After standing for ten minutes, a colorless liquid results (*methyl alcohol*).

Acid Number for Resins

The acid number of a resinous substance is the quantity of potassium hydroxide (expressed in milligrammes) required to neutralize 1 Gm. of the resinous substance. Dissolve in alcohol about 2 Gm. of the resinous substance to be tested, accurately weighed, add a few drops of phenolphthalein T.S. and titrate with half-normal potassium hydroxide V.S. The number of mils of half-normal potassium hydroxide V.S. required for neutralization, when multiplied by 0.028055 and the product divided by the weight taken, gives the acid number of the resin. The reaction is often more distinct if an excess of half-normal potassium hydroxide V.S. is used and the excess titrated back with half-normal acid V.S.

Reagents

Arsenic Trioxide (Arsenous Oxide), As_2O_3.—For use in the Arsenic Test use arsenic trioxide which complies with the description and tests given in the United States Pharmacopœia.

Ferric Ammonium Sulphate, $FeNH_4(SO_4)_2 + 12H_2O$.—Pale violet, octahedral crystals, without odor, and having an acid, styptic taste; efflorescent on exposure to the air. Soluble in 2.7 parts of water at 25° C. and in 0.8 part of boiling water; insoluble in alcohol. The addition of 0.5 mil of nitric acid to 10 mils of a solution of the salt (1 in 20), followed by a few drops of silver nitrate T.S., produces no turbidity (*chloride*).

Ferric Ammonium Sulphate Test Solution.—Dissolve 10 Gm. of ferric ammonium sulphate in sufficient distilled water to measure 100 mils.

Glass Wool (Spun Glass).—Fine thread of spun glass. Two Gm. of glass wool when digested on a bath of boiling water for one-half hour with 100 mils of diluted hydrochloric acid, the mixture filtered and the filtrate evaporated to dryness and then dried at 110° C., leaves not more than 0.01 Gm. of residue (*soluble matter*). Boil 1 Gm. of glass wool for a few minutes with a mixture of 25 mils each of diluted nitric acid and distilled water; filter, evaporate the filtrate to dryness, and treat the residue with 10 mils of distilled water and again filter it; the filtrate is not affected by the addition of hydrogen sulphide T.S. (*lead*).

Hydrochloric Acid, Concentrated, for Tests, HCl.—An acid of specific gravity between 1.170 and 1.184 at 25° C. (35 to 38 per cent.), which must respond to the following tests of purity: Evaporate 100 mils of the acid to about 5 mils, dilute it with 10 mils of distilled water, and add a few drops of barium chloride T.S.; no precipitate occurs within twelve hours (*sulphuric acid*). Evaporate 50 mils of the acid to dryness on a water bath; not more than 0.002 Gm. of non-volatile residue remains (*non-volatile solids*). Add 5 mils of the concentrated acid, diluted with 50 mils of distilled water, to a solution of 1 drop of tenth-normal iodine V.S. in 50 mils of distilled water to which a few drops of starch T.S. have been added, no decolorization occurs (*sulphurous acid*). Dilute 10 mils of the acid with about 100 mils of warm distilled water (at about 50° C.) and thoroughly saturate it with hydrogen sulphide; no dark coloration or precipitate forms either before or after neutralizing with ammonia water and adding a few drops of ammonium sulphide T.S. (*heavy metals*). Two mils of the acid, diluted with 10 mils of distilled water, when subjected to the Arsenic Test (see page 355) produces a stain not greater than that produced by the zinc.

Hydrogen Sulphide, H_2S.—A gas generated by treating ferrous sulphide with diluted sulphuric acid, and washing the gas as directed below under the Test Solution.

Hydrogen Sulphide Test Solution (Hydrosulphuric Acid).—A saturated, aqueous solution of hydrogen sulphide. To prepare about 1000 mils of the solution, treat 20 Gm. of ferrous sulphide in a suitable apparatus with a mixture of 20 mils of sulphuric acid (U.S.P. IX) and 250 mils of distilled water, pass the gas through a drying tube filled with granulated calcium chloride, then from this through a tube of about 8 millimeters diameter and 40 centimeters in length, which contains about 5 Gm. of coarsely pulverized iodine mixed with glass wool (see page 361), and finally through a wash bottle which contains a small quantity of potassium iodide T.S. The gas thus purified is conducted nearly to the bottom of a bottle of the capacity of about 1500 mils containing 1000 mils of cold distilled water. Shake the bottle occasionally to facilitate the solution of the gas. When the gas is no longer absorbed, transfer the solution to small, dark amber-colored bottles, fill nearly to the top; pass a stream of purified hydrogen sulphide for a few minutes through each, and then at once stopper them tightly, and preserve them afterwards in a cool and dark place. Do not use this solution unless it retains a strong odor of hydrogen sulphide, and, when added to an equal volume of ferric chloride T.S. produces at once a copious precipitate of sulphur.

Lead Acetate Glass Wool.—Immerse glass wool (see page 361) in a mixture of equal parts of lead acetate T.S. and distilled water and remove the excess of liquid by pressing it between filter paper. Prepare the glass wool, as just described, immediately before it is required in the test.

Lead Acetate Test Paper.—Immerse strips of heavy white filter paper, 6 cm. in width and 8 cm. in length, in a mixture of equal parts of lead acetate T.S. and distilled water, drain off the excess of liquid and dry the paper on glass in an oven at 100° C., avoiding contact with metal.

Lead Acetate Test Solution.—Dissolve 10 Gm. of clear, transparent crystals of lead acetate, free from adhering lead carbonate, in sufficient distilled water to measure 100 mils. Preserve the solution in well-stoppered bottles.

Lime, Freshly Slaked.—To prepare freshly slaked lime for the Opium Assay, drop upon a convenient quantity of lime one-third of its weight of water, cover it and allow it to stand until the lime is slaked and cooled.

Mercuric Bromide, $HgBr_2$.—White rhombic needles or prisms or lustrous scales or a granular, crystalline powder, fusing at about 325° C. and subliming without decomposition. Soluble in 200 parts of water at 25° C. and in 25 parts of boiling water; readily soluble in boiling alcohol.

Mercuric Bromide Test Paper.—Cut stiff, heavy quantitative filter paper (see Filter Paper, Quantitative, U.S.P. IX) into strips 3 mm. in width and about 12 cm. in length. Immerse these strips for five minutes in alcoholic mercuric bromide T.S. (see below). Remove the excess of solution by pressing the strips between filter paper and then dry them quickly on glass in an oven heated to 100° C. Place the strips at once in a wide-mouthed bottle and stopper it securely.

Mercuric Bromide Test Solution, Alcoholic.—Dissolve 5 Gm. of mercuric bromide in 100 mils of alcohol, employing a gentle heat to facilitate solution. Keep it in glass-stoppered bottles protected from the light.

Sawdust, Purified.—Moisten 1000 Gm. of oak sawdust, in approximately No. 20 powder, with water, pack in a cylindrical percolator and pour on enough of a 1 per cent. solution of sodium hydroxide to saturate the powder and leave a stratum above it.

When the liquid drops from the percolator, close the lower orifice and macerate the sawdust during twenty-four hours. Then proceed to percolate slowly until the alkaline percolate measures 5000 mils. Now continue the percolation with 4000 mils of 1 per cent. hydrochloric acid and then with water until the acid is all removed and the percolate is neutral. Finally dry the powder.

Stannous Chloride, $SnCl_2 + 2H_2O$.—Colorless crystals, readily soluble in water or alcohol. When in contact with the air or excess of water, the salt readily forms a basic chloride, hence, when dissolved, its solutions should be acidulated with hydrochloric acid. When tested for arsenic as directed under the Test for Arsenic (see page 355), 0.3 Gm. of stannous chloride produces no stain. Two Gm. of stannous chloride, dissolved in 1 mil of distilled water and 0.5 mil of hydrochloric acid, does not become opalescent on diluting with 20 mils of distilled water (*lead*). Alternative method: Heat reagent tin for several days with concentrated hydrochloric acid (see page 361) upon a water bath, taking care that the metal is in excess. When the acid has become saturated, pour off the clear fluid from the undissolved tin, filter it while still hot through asbestos and set it aside until crystallization takes place. Break up the crystals, drain, and dissolve them at once as directed under the Test Solution.

Stannous Chloride Test Solution, Acid.—Dissolve 40 Gm. of stannous chloride crystals (see above) in 60 mils of concentrated hydrochloric acid (see page 361) and preserve it in a glass-stoppered bottle.

Stannous Chloride Test Solution, Saturated.—(For Bettendorf's Arsenic Test.) Prepare a saturated solution of stannous chloride crystals (see above) in concentrated hydrochloric acid (see page 361) or evaporate a solution prepared from metallic tin by the alternative method under *Stannous Chloride* (see above) to a specific gravity of about 2.00 at 25° C. After filtering the solution through asbestos it is transparent and has not more than a pale yellow color.

Sulphuric Acid, Purified and Concentrated, for Tests, H_2SO_4.—When concentrated sulphuric acid is specially directed in a test, it is intended that the strongest purified acid of a specific gravity of not less than 1.834 at 25° C. is to be employed. In addition to the tests prescribed for this acid under *Acidum Sulphuricum* (see U.S.P. IX), it is required to conform to the following more rigorous tests before it can be employed as a reagent: Dilute 1 Gm. of the acid with 4 Gm. of distilled water; no stain is produced by 25 mils of this diluted acid when subjected to the Test for Arsenic (see page 356). Dilute 1 mil of the acid with 9 mils of distilled water, cool and pour it so as to form a layer over 5 mils of diphenylamine T.S.; no blue color appears at the zone of contact (*nitric acid*). Upon carefully pouring about 2 mils of hydrochloric acid, in which a particle of sodium sulphite has been dissolved, over about 2 mils of the concentrated sulphuric acid, no reddish zone appears and no precipitate forms (*selenium*).

Sulphurous Acid.—An aqueous solution containing not less than 6 per cent. of sulphur dioxide. Ten mils of this solution, when diluted with 10 mils of dilute sulphuric acid (see under Arsenic Test, page 355) and evaporated on a water bath until free from sulphur dioxide, does not produce a stain when subjected to the Test for Arsenic (see Test). Introduce about 2 mils of the acid into a flask containing 10 mils of distilled water and previously tared, stopper and weigh accurately. To this add 50 mils of tenth-normal iodine V.S., allow to stand five minutes, then titrate the excess of iodine with tenth-normal sodium thiosulphate V.S. It shows

not less than 6 per cent. of SO_2. Each mil of tenth-normal iodine V.S. corresponds to 0.003204 Gm. of SO_2.

Zinc, Zn.—Pure metallic zinc. Zinc for the Arsenic Test: Zinc in mossy or globular form, the latter about 3 to 6 mm. in diameter, known as No. 7 Shot Zinc. This must conform with the tests for purity as given under *Zincum* (U.S.P. IX) and in addition the following: The stain from 8 Gm. of zinc when determined by a blank experiment, as directed under the Test for Arsenic, should scarcely be perceptible. Introduce 10 Gm. of the zinc into a flask of about 250 mils capacity, provided with a perforated rubber stopper and a rubber-valve tube, and containing 60 mils of distilled water, 15 mils of concentrated sulphuric acid for tests (see page 363) and 1 drop of copper sulphate T.S. When the reaction slackens, place the flask on a water bath and warm until the solution of the zinc is complete. At once begin to add tenth-normal potassium permanganate V.S., drop by drop, with agitation, until the solution assumes a faint pink tint which remains permanent for one-half minute. Not more than 0.15 mil (3 drops) of the tenth-normal potassium permanganate V.S. is required, indicating not over 0.008 per cent. of metallic iron (Fe) calculated as oxidizable matter. (The presence of metallic iron at or below this limit is permissible.)

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NOTE—Synonyms are placed under the official Latin or English titles in small type and without page numbers. They will also be found in their alphabetical places, with page numbers.

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